

CURRENT NOTES

Helping Atari Owners Through the World of Computing

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Program Manager
File Options Window Help
To start a Gemulator 4.0 window, just click the icon.

Calamus File Options
DOCUMENT\PRINTER.CDK, Page 1
Rotated text example at a 35.3° Angle

Gemulator 4.0 - TOS 2.06, 4M, 640x480 Mono
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Quick Index 2.2
The ST/Ste/TT Performance Index
by Ignac Kolenko and Darek Misko
C31991 Branch Always Software. Not public domain.

System performance:	A:	B:	C:	D:
CPU memory	751%			
CPU register	389%			
CPU divide	1779%			
CPU shifts	2563%			
DMA 64K read	8%			
6EMDOS files	239588			
Disk (RPM)	98888			

Using TOS 2.6

	1.0	1.4	STE	TT
TOS text	283%			
TOS string	192%			
TOS scroll	431%			
GEM dialog	241%			

Set TOS and monitor type
Low Med Mono

Reboot GEM Ctrl+F12
Toggle Color/Mono Shift+F12
Memory Size... 512K 1 Meg 2 Meg 4 Meg 8 Meg 14 Meg
Screen Acceleration...
Hard Disk Access...
Other Options
Save Settings
About Gemulator...
Exit

As this Windows 3.1 screen shows, you can run Atari ST and Mega ST / STE programs side-by-side along with your MS-DOS and Windows programs. Why wait for Windows versions of your favorite Atari programs (which may or may not ever appear) when **Gemulator 4.0 runs them now!** Our users have been running Pagestream, Calamus SL, and all their favorite Atari programs on their PCs since 1992.

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Gemulator 4.0 costs \$159.95. TOS 2.06 ROMs extra. Upgrades are \$59.95.

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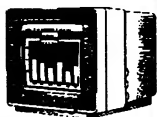
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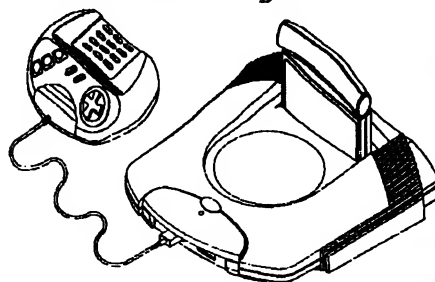
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The End of an Era

by Joe Waters

Last month at this time, I thought my career was just about over. I hadn't been to work in a week; I could not move any of the fingers in my right hand; and I had a continuous pain in the back of my right hip and down my right leg. And, in spite of medication, I saw little, if any, signs of improvement. Well, after another week or so, things did ease up. The attack of carpal tunnel syndrome slowly faded and I could start moving my fingers again. But even today, a month later, if I try doing too much clicking of the mouse button, my fingers start tingling again.

If that wasn't a clear sign, I'm not sure what would be. Old age is catching up with me. My eyes have grown weak and sensitive to the light. It is difficult to read and it is hard to edit on the bright Moniterm monitor without squinting my eyes. What's more, when I get home from my day's work, I just don't have the energy I used to have to tackle an evening working on *CN*. This old engine is running out of gas.

I have published and edited *Current Notes* for 11 years now. It is time to step down and turn over the reigns to a new, more invigorated, generation. So, you see before you, my last issue of *Current Notes*. The next issue you receive in the mail will be published by a new group under the editorship of Howard Carson. The "new" *Current Notes* will be maintained at its current page count and format size, but look for an entirely new, exciting look and feel as *CN* continues its bold march into the technological future. Of course, everything won't be new. Expect to see many of the *CN* faithful in upcoming issues. Even yours truly, now that I will have some time again, may contribute some pieces from time to time.

Now, however, it is time to say goodbye. When I started this adventure back in May of 1984, I had no idea what I had gotten myself into. But, if I were going to edit a newsletter, I was going to try and do my best.

It is now 11 years later and over that time period, Joyce and I have never missed an issue. We published 107 issues, over 7,500 pages, and more than 2,200 articles.

Obviously, we could not have done this alone. Not counting "Letters to the Editor," more than 400 authors wrote for *CN*. Some may have only contributed an article or two, but many wrote for us, that is, you, the *CN* reader, for many years. Many of the contributors were regulars, either producing reviews and/or tutorials over an extended period, or "columnists," who committed to write an article for each issue.

Over 900 articles, 41 percent of the total, were contributed by *Current Notes* columnists. These writers provided readers with the core of each issue. A number of our columnists contributed their time and effort over many years and helped shape and define the very soul of this magazine. The late Frank Sommers provided 64 "ST Update" columns from 1986 to 1994. Dave Small contributed 62 "Small World" columns from 1987 to 1995. Andrzej Wrotniak penned over 50 "ST Toolbox" columns since 1989. Richard Gunter (Starting Block), John Barnes (Junkyard Pussycat), and Dave Troy

(Myths and Mysteries) all added about 45 columns each over the years. Bob Kelly's "Atari Scuttlebits" provided readers with Atari news in the early years from 1984 to 1988. The numbers cited above only represent the "columns" penned by these gentlemen. Many had articles before they became columnists and many wrote pieces in addition to the column.

Sometimes, a column went through several authors. "Atari's Small Miracles" (a listing of short programs written in Atari Basic) was started in 1985 by Mark Brown. In 1988, Joe Russek took over and continued the column for more than a year, after which Frank Kweder provided Miracles for yet another year.

When the Magic Sac was hot, Jeff Greenblatt provided coverage throughout 1987 and 1988. Doug Hodson continued with tips for Spectre users in 1989 and 1990.

Adventurers were treated to tips from the very beginning. In 1984 Stevenson and Burke started "Tips 'N' Traps" which provided hints to help players through those tough spots. Jim Stevenson continued the column in solo mode in 1987 and 1988. In 1988 Robert Millard started "There and Back Again" for the role-playing enthusiast and the following year, Sam Wright started the first of 22 "Stuck in a Rut" columns.

Musicians had Jay Gerber's "Musical Notes" in 1984, "Music, MIDI, and You" by Mike Lehr in 1986 and then continued in 1987 by Grant Slawson. In 1993, Gary Woods launched his "Woods Music," which continues in this issue.

Beginners (and non-beginners) have always found tutorials in *CN*, but in 1986, Ron Peters launched "Accent on Basic Computing" to provide new users with the ABCs of Atari computing. In 1988 Richard Gunter continued our "new user focus" with his long-running "Starting Block" column.

The columnists have been a significant contribution to the ongoing success of this magazine. For the past 11 years, articles have just shown up when it was time to put an issue together. With a solid group of strong, regular contributors, I could always count on an interesting and exciting magazine even though I never knew from month to month what would appear.

Among the columnists who were so prolific were some who played a double-role: they were also editors. By 1986, *CN* had expanded considerably and I asked Frank Sommers to become ST Editor. As such, he wrote a monthly news column and also handled all the contact with reviewers of ST products. This was a big help to me. Frank continued all the way until 1993 when Steve Kiepe took over the job for about a year and then, more recently, Paul Lefebvre tackled this post.

In 1987 Len Poggiali appeared as an 8-bit enthusiast and an excellent writer. To assure continued coverage for 8-bit users, I asked Len to become the XE Editor in 1988. Two years later, Len stepped down and Ben Poehland came on as XE Editor. After two years, Ben also left to launch his Atari Classics and Rick Reaser, the current 8-bit editor, came on board.

All of these editors were enormously helpful and we owe them all a great deal of thanks. They not only worked with reviewers and vendors, but monitored the Atari market and kept us informed throughout the years. By the nature of their columns, you won't see titles listed in the Tribute to Authors since these columns, like some others, tended to deal with a

variety of topics and did not lend themselves to a single title. But they were critically important and of keen interest to all our readers.

As a tribute to all those who were regular CN contributors over the years, the listing below shows all the columns published in *CN* over the past 11 years. We list the column title, the author, and the number of columns that were written. ST and XE Editors are in italics.

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New Products, New Internet Stuff, and New Beginnings

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As usual, it's been busy in Toadland. We've been getting in lots of new products, like *MagiCMac* and the Catbox. We just finished another catalog. Jennifer and I went to Toronto and we're going to Sacramento. We've been working on our Web site, and there's some Internet news for Atari users, as well.

Toronto

Jennifer and I made the marathon trip up to the Toronto ACE show. If I haven't already said it enough, allow me to say, one more time, that this was a first class event. It's rare to see an Atari show these days that's able to get a good quantity of visitors, a variety of vendors, a schedule of decent seminars, and also be organized by folks as pleasant as Howard Carson and the other members of TAF. Bravo!

One of the seminars was hosted by Sam (whose last name I apologize for forgetting) who had set up his TT030 and 19" mono monitor to run MiNT (the multitasking TOS kernel by Atari's Eric Smith), X-Windows, and *Chimera*, a Unix-based World Wide Web browser compiled for MiNT. Unfortunately, we were unable to dial out from the hotel to demo the browser live (dang those hotel phones—we tried dialing 9, 8, 1+9, 9+1—nothing would work), but even with statically loaded files, *Chimera* makes a cool demo.

Once again, to reiterate for those of you who have missed previous columns on the subject, the World Wide Web is a collection of documents stored on computers connected to the Internet. Each one of these computers is called a "web site" and is running "web server software." The documents on the Web are hypertext documents (text documents that contain links to other documents which may exist on the same or any other computer). Hypertext documents may also contain pointers to graphics files (GIF's or JPEG's) or sound files (.au or WAV files). As a result, the World Wide Web is a rich multimedia environment which can contain graphics (even 3D graphics, as Silicon Graphics has settled on a standard virtual reality file format), sound, text, animations, MIDI files, or any other kind of file which can be processed by a computer.

Hypertext documents and the sound/graphics/text files to which they point are not machine specific at all. Hypertext Markup Language (HTML) is a "meta-language," meaning that it speaks in broad, theoretical terms. HTML documents are "served" by the "web-server software" and

interpretation of these meta-documents is left to whatever "client" your machine may be running. This is one example of the current trend towards "client/server" computing. In this model, the server has some brains and can "connect" to many different types of clients simultaneously. The client must also have some brains in order to be able to interpret the data it is getting from the server. In addition, the client must have enough computing power to be able to connect to a variety of servers. This is the opposite of "mainframe computing," where folks used dumb terminals to access a single all powerful computer—a computer that is charged with the task of not only managing data, but also keeping track of what every single screen is doing, monitoring everyone's keyboard input, etc.

We could say that the Internet/world-wide-web is a client server environment, while traditional online services like GENie, CompuServe, Delphi, and even America Online are "mainframe based." Even though all of these services are now offering some client software, it has taken some time and it is not the way these systems were originally designed. At their core, these systems are still mainframe based and are not based on distributed servers. Should they be? Maybe. If these services used standard clients, it might save them some money on R&D. It also might unclutter a PC hard drive.

Anyway, now that we have a little vocabulary under our belts, we can take a look at how *Chimera* works and how you can use your Atari to surf the Web. When you're running a Web client, there are many "layers" to consider:

- | | |
|--------------------------|---------------------------|
| 1 MiNT | [operating system layer] |
| 2 MiNTNet PPP connection | [TCP/IP networking layer] |
| 3 Chimera Program | [application layer] |
| 4 X-Windows | [GUI presentation layer] |

I just made this system up—there's nothing official about the terms used—but it describes, fairly accurately, what's going on when you're using *Chimera* as a Web client. MiNT handles local disk access and other standard OS calls. MiNTNet handles the PPP (point-to-point protocol) connection to the Internet. This gives you a 32-bit 000.000.000.000 format IP (internet protocol) address, which is required for any computer connected "live" to the Internet. The PPP connection handles the transport of information between your computer and the Internet.

The *Chimera* program makes requests for hypertext documents using HTTP (hypertext transfer protocol) requests over the PPP connection. The network delivers those documents, in full, to *Chimera*, and *Chimera* “interprets” them for display on your system, just as we described earlier. If you have a black and white 19” monitor, as Sam in Toronto did, *Chimera* will process a color picture (a GIF file maybe) by discarding all the color data and dithering the picture in monochrome. As you can see, the client is doing some work here. *Chimera* also has to decide what HTML tags like “h1” (heading 1) mean—what font should be used, etc, to display this information locally.

After *Chimera* chews all this info for you, it is then handed to the X-Windows display for you to view it. X-Windows is a simple system not unlike the AES in TOS. It manages windows, the mouse, and screen gadgets, reports “events” and draws “objects.” It is a standard, simple user interface and it’s the same on an Atari as it is on a SGI.

While all of this is perfectly sensible, there are some practical considerations. First off, to run all four of these “layers,” including MiNTNet, you need a fair amount of resources—like RAM and hard disk space. 4MB is really tight, but I am told it works. A 640 x 400 monochrome monitor is not very good for an X-Windows display, as it tends to be hungry for real-estate (all those fonts and window gadgets and pictures and all). In addition, if you’re going to be transferring all of the data to your computer for interpreting (even color picture data that you may not be able to display), you will want a very fast modem. 14,400 baud would be OK, but 28,800 (or better) would be desirable.

A Possible Cure

A good alternative to running a complete local client is to run the computing part of the client on the machine which gives you your Internet connection and use your Atari as a display client only. This eliminates the *Chimera* layer and can dramatically speed up performance. Here’s how this might work:

1. Log into your PPP account using MiNTNet.
2. Start *X-Mosaic* on the remote Unix computer.
3. Tell it to send its display to your Atari’s X-terminal screen.

This is a good option because, when you run *Mosaic* on a remote computer, it is able to send and receive information to and from the Internet much faster than you can. (It is probably connected by ISDN or T1 lines, while you’re limited to 28,800.) This means that when you make requests for documents or submit queries, they will be handled much faster.

After documents have been received by the remote *X-Mosaic* program, that program (running on a computer which probably has a processor very much faster than your Motorola 680x0) interprets the data, dithers the pictures, and formats the fonts for your X terminal, and then transmits only the data you need for display on your screen.

This method is preferable because it means that you 1) don’t need as much memory 2) don’t need as fast a modem link and 3) don’t need to run *Chimera*.

For those of you who have accounts on Unix machines and want to get going with this kind of a setup, I suggest you ask around on the comp.sys.atari.st newsgroup.

Getting All This Swell Stuff Setup

Because MiNTNet/*Chimera*/X-Windows is constantly evolving, it’s difficult to tell you exactly the best way to get started. All of this stuff is available at major Atari ftp sites, including atari.archive.umich.edu. One difficulty in setting this up that folks have encountered is that MiNTNet needs to be compiled (using the GCC compiler) from ‘C’ source code.

Sam was talking about putting together a set of disks, from which people can get an elementary MiNT/MiNTNet/*Chimera* setup going (with compiled binaries) and making this set of disks available to members of the TAF user group. I spoke with him and we’ll try to have this disk set available through Toad Computers, as well. If all goes well, in fact, it would be fun to put together a CD of all Atari MiNT/X-Windows/*Chimera* related files, and this is a project that we may very well undertake. Keep in touch with us for more info on this front.

GENie Gets Wired

As of April 11, GENie opened the gateway to its Internet access service. I have not had a chance to look at the details of their service very closely. But there is one thing I did want to look at, and that is *Lynx*, the text-based World-Wide-Web browser. *Lynx* runs on GENie’s computers and uses your Atari as a VT100 terminal. Using GENie and *Lynx*, it is possible to access Toad Computers’ home page (where you can do stuff like buy a Jaguar, look at parts of our catalog, or get product specs), as well as “surf” the rather large assortment of Atari-related Internet sites on the Web.

Because *Lynx* is text only, you will not have access to all of the inline graphics or text/font/formatting capabilities that you’ll find in browsers like *Netscape* or *Mosaic*, or even *Chimera*. But it does provide basic access, it is fast enough to be quite usable (even at 2400 baud), and if there is a picture or file that you really want to download, you can transfer it to your machine using ZMODEM.

Finally, there is an easy way for GENie users to get reasonable access to the Internet! Don’t be afraid to try it out. It’s very easy. Follow these basic steps.

1. Go to GENie’s Page 5000. (use the m5000 command from a prompt)
2. Enter the Internet, select “Browse the Web using Lynx”
3. You’ll get to GENie’s home page. Press “G” for GO.
4. Type in the URL (uniform resource locator) of the

Toad Computers home page:

<http://www.charm.net/~toad/>

5. Watch and be amazed!

You'll be taken right to the Toad Computers' home page. Poke around. Request a catalog if you aren't already on our mailing list. Read the latest news. One quick note: to use GENie's Internet service you'll need to turn off half duplex/local echo that you normally would have on when using GENie. (You can do this in your terminal program.) The other thing is that you will need to use a VT100 compliant terminal program like *Stalker* or *Flash* to use *Lynx*.

MagiCMac

Another neat product that's just become available is *MagiCMac*. *MagiCMac* is a version of the MagiC multitasking TOS alternative which is written for Macintosh computers. In short, it's a way for you to run Atari software on a 68030/040 based Macintosh computer. It does not, however, run on Power PC machines (the Power PC machines run 680x0 programs in emulation mode, anyway, so this is probably not a very good pursuit).

I recently installed *MagiCMac* onto a Performa 475, which is a 68030 machine running at 16MHz. It is, essentially, the same spec as the Falcon030, although it lacks all the custom chips in the Falcon, and the DSP. But for just running programs, it does OK.

MagiCMac requires a bit of RAM to run—at least 8MB. (The Performa 475 has 4MB on its motherboard with 2 SIMM sockets, which I had populated with 2MB of RAM for a total of 6MB. This was not enough. I pulled out the 2 1MB simms and replaced them with 2 4MB simms, giving the machine 12MB of RAM). Once I figured out how to set all the dialog boxes up, the "Atari" booted right up. The EASE desktop replacement (included with *MagiCMac*) appears, and you're ready to run Atari software. I installed *Calamus SL*. Without doing extensive testing, I can say that it seemed to run fine.

Printing to parallel printers is handled the same way it is handled under Spectre GCR. You need the program, *Power Print*, which includes printer drivers for many popular dot-matrix and laser printers, along with a serial-to-parallel conversion cable. I have not tried this, yet, under *MagiCMac*, but I don't expect any surprises with it.

As for speed, it is quite impressive. Because it runs MagiC at its heart (which is itself faster than TOS), it does multitasking, and you can multitask Atari programs alongside Mac programs under System 7. It's pretty keen. If you press Command-W, you can switch back and forth between Atari and Mac "modes." Ejecting disks is no problem (once you check the manual). You just press Command-Shift-I to eject the disk in drive "A". All in all, getting used to *MagiCMac* is not a problem.

The place where you're really going to see a speed increase with *MagiCMac* is when you run it on a 68040 machine running at 25, 33, or 33/66mhz. Because Atari pro-

grams are accustomed to running at 8mhz, when you run them on a fast 040 processor (which is, itself, already a lot faster than a 68000 or 030), things really move. Since we're selling *MagiCMac*, we'll be setting it up on a few different Macs and seeing how the performance compares.

Gemulator, which does a fine job of emulating an ST (and now STE with *Gemulator 4*) on a 486/Pentium, has to do a lot more work than *MagiCMac*. The core of the *Gemulator* is a 68000 emulator in software. Then, TOS is run as a program on the virtual 68000. Patches are made to accommodate for sound, video, keyboard, and other I/O differences, and then you're done. You have a virtual ST. The more compatible the "soft" 68000 is with a real 68000, and the more complete the patches, the more compatible the ST(c) becomes.

With *MagiCMac*, it is not necessary to translate for a different CPU. It's the same (or better) CPU. So, the programs run natively. Sure, the same sorts of patches must be made to accommodate for differences in I/O behavior, but, at least, you remove that formidable task of emulating an entire CPU in software.

Granted, the downside of running *MagiCMac* (if you intend to use it to replace your Atari hardware) is that you are forced to buy a 030/040 based Mac. And if you were intending to buy a Pentium 100 or 486DX4-100, this is not good news. But, if you're really serious about Atari emulation, consider both *Gemulator* and *MagiCMac* anyway. There's no doubt that *MagiCMac* is smoother and faster, but you may find that *Gemulator* (because it's running real TOS) is more compatible in some cases, too. And *Gemulator*'s speed is nothing to sneer at, either. With a fast PC, it runs much faster than a 8mhz 1040ST.

DA's Layout

Digital Arts, the folks who brought us *DA's Picture & DA's Vector*, have produced a high-end DTP package called *DA's Layout*. Only one problem: there's no English language manual right now. I, recently, had an opportunity to see this program demonstrated and, from what I've seen, it's every bit as complete and professional as *Quark Xpress* or (gigggle) *PageMaker*.

For our most recent catalog, (which we are mailing now in early April), we decided to go with color covers. Because of the way the thing is laid out, this means that we could also get full color on six other pages at essentially no extra cost. So I set out to do color publishing.

Regular readers of this column should know that I lean towards *PageStream* as DTP of choice (on a TT030 with a 19" mono monitor). However, for this color work, given that I would have to do a lot of color scanning and also use a color display, I opted to do the work on my PC using *QuarkXpress*. Things turned out well. Once I cleared up a few weird bugs with *Quark*, I had produced 32 pieces of film (using a local service bureau and a Panther imagesetter) and was ready to go.

I used *PageStream* for most of the internal black and white stuff, and that, also, was set on the Panther imagesetter. Everything came out fine. A lot of folks really worked hard to see that the catalog got done quickly, and, as a result, it was less than 2 weeks from concept to completed catalogs.

I mention *Quark* because it's a nice program. Its screen redraws are fast, its picture handling is admirable, and its font management is fine. But... if I had an opportunity to do it again using *DA's Layout*, things might have been different. From what I have seen of it, it's quick, it's PostScript compatible and it seems intuitive and easy to use. And, it supports color well. System Solutions, a British Atari firm with whom we do much trade, uses it to do color product literature, and the results they have achieved are quite impressive. Next time around, perhaps *DA's Layout* will be an option. I think it will be; the rumor is that the English manual will be available very soon, and as soon as that happens, *DA's Layout* will grace the shelves here at Toad Computers.

Calamus SL would have been a good choice, as well, but as I am forced to produce PostScript output in order to get negatives locally, I really can't use it. However, if you are able to take some time to get your negatives processed by a Calamus-capable service bureau (such as DMC Publishing themselves), *Calamus* delivers tight control over color separations, screening, and a lot more.

Chromatography

When chemists want to separate mixtures of chemicals, they blast them apart, mix them in a carrier substance, and then toss them into a gradient magnetic or electric field. The heavier pieces tend not to move very far or very fast, and the lighter pieces travel to the far end of the spectrum. This allows the chemist to sort and analyze the components of a mixture.

From what I understand, the mixture that we know as *Current Notes* is exploding. However, this does not mean that the 'pieces' of *Current Notes* will cease to exist (good thing for that conservation of matter rule!). Rather, they will be tossed and sorted, and it is up to you—the reader of this mixture—to watch and see what happens to the pieces.

For my part, I guess you could say that I'm happy where I am and that I'll continue to be involved in the Atari market for a long time to come. We've built a business around Atari computers and that business continues to thrive in what many folks would call a "dead" market. Why are we doing OK? Because we know it's not a dead market, we advertise, and we take pride in our work. We're not getting out of the Atari market; we'll continue to support national magazines like *ST Informer* (which just keeps on keepin' on) as well as regional publications and Atari events. In addition, we're going to step-up publication of our catalog so that everyone can hear from us regularly about the newest products for the Atari. Toad Computers and I will support any new magazines that may be born out

of *CN*. And we'll also be selling the new *Atari World* magazine, published by the British folks who did *ST Review*.

Today, I built a crystal radio set, and, in the back of the book for the kit, there was an address where I could write away to get a subscription to "Xtal Radio," a magazine dedicated to users of Crystal Radios. Crystal Radios? You mean the little unamplified radio sets that can only receive AM and require you to hook a tuned coil up to a hunk of gale-na (lead sulfide) crystal? Yes! That's precisely what I mean. Who needs a crystal radio (unamplified AM) when you can get a boom box with CD player?

Once again, we are faced with the question: define obsolete. If it is useful, if it brings joy, if it imparts understanding, if it eases tension, if it aids learning, if it sorts your recipes, if it helps you to figure out how electrons work, if it helps you file your taxes, if it doesn't have to run Windows, if it can print a birthday card, if it can play a fun game, if it can send a FAX, if you love it, it is not obsolete.

I've always said that computers are not like wives (or husbands): you can have more than one. Computers are tools. If you need two tools, buy them. If your Atari can do a job that a PC can't, keep the Atari around. If you need a PC to be compatible with your job, buy a PC. Computers do not demand mutually exclusive relationships.

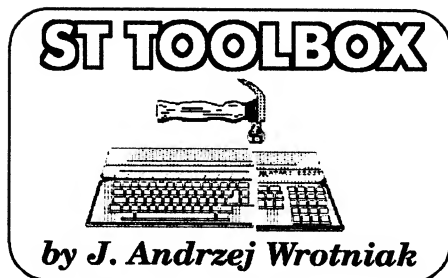
I will not eulogize *CN* or the Atari computer. Even with this (collector's edition!!) last issue of *CN* as published by Joe and Joyce Waters, neither the magazine nor the computer is dead. It is our duty, as components of this publication, to be blasted, scattered, and sorted. I have no doubt that pieces of *CN* will be turning up all around the Atari world.

Here's to a master chemist and her husband: Joyce and Joe Waters. (Both have Cornell PhD's—Joyce's in Chemistry, and Joe's in Economics 1971!) These two make a good combination. While Joe is officially the editor, I know that Joyce has edited an equal amount of text! I thank them both for the opportunity to be involved with *CN* for the last six years as a writer and for the last nine as an advertiser. Writing for *CN* has meant a lot to me. It has been FUN to hear the feedback from readers and to try to write about something that people want to read. Lastly, THANK YOU for reading for six years.

If you want to talk about being blasted and scattered, or find out more about MiNT, here's how:

E-Mail:	toad@charm.net
WWW:	http://www.charm.net/toad/ [check the tilde again]
Mail:	Toad Computers 570 Ritchie Highway Severna Park, MD 21146-2925
Phone:	(410) 544-6943
FAX:	(410) 544-1329

We'll see you in Sacramento!



A Farewell to Atari

Two days ago, Joe Waters called with the sad, yet not surprising, news.

"We are saying a goodbye to our readers. Are you going to write something?"

Yes, Joe, I am. I might have kept mum for the last year or so, but nothing will stop me from saying a goodbye to the people with whom we were sharing all this fun during the last eight years.

And fun this was. Writing for *Current Notes*, interacting with the people who read my column (all three of them, that is), meeting them at the AtariFests, getting letters from the users of my programs, making friends, learning things.

Well, all good things come to an end. Too bad Atari blew it.

How Atari Blew It

Ten years ago, the ST was a state-of-the-art, cutting-edge system, outperforming the Mac and running circles around PC clones. Unfortunately, from the very beginning, it lacked three basic things: any reasonable degree of support for developers, decent dealer relationships and even a minimal degree of a market push.

Long ago, in the former Soviet Union (I still like to roll the "former" on my tongue!), something would be released on the market. With no advertising, no announcements, people would somehow know about it, stand in a line overnight, and then it would turn out that all the goodies were already sold to the sales clerks and their families.

I am sure Atari would easily survive, even thrive, in such conditions. We were, however, playing this game in a very different place, in a different time.

When I was working on an Atari ST-based graphic display system for the NASA Cosmic Background Explorer project, the Atari ST looked like a computer specifically created for such purposes. Fast, no-nonsense and easy to program graphics, linear memory space (yeah, wait for Windows 95, you are in for a surprise!), and then-high resolution color monitor support promised within a year or two...

First, the promised color display never materialized. Don't tell me about the Falcon; when it finally arrived, after years of announcements and postponements, the ST line of computers was already, for all practical purposes, dead.

Second, the credibility of Atari's corporate management soon became the laughing stock of the community. All we need is just three yearly "but this time we really, really, mean business" declarations and people laugh behind your back when you run the next press conference on the multimedia revolution, led by Mr. Sam T. on a white horse.

The Good Times and the Bad Times

This leads to a question: were we, the ST users, just a bunch of suckers, lured into buying a doomed technology by some fast-talking operators?

I don't think so. First of all, Atari really succeeded in bringing to the market a wonderful computer for a very affordable price, and at the right moment. What they did wrong, was just about everything else.

Second, a computer is a computer is a computer (unless we are talking about an IBM mainframe). All of those who learned how to use and to program the ST, learned something they can use on any machine, any operating system. (People who have to learn everything from scratch every time they change the platform should keep away from using, programming, or even looking at computers. They still can find something to do to be useful to the society, like picking roadkill on highways or becoming litigation lawyers, but this is out of scope of this column).

Using the ST (and, even more, programming it) was a very enjoyable experience. The technical advantages of that machine were just one of the reasons. The other one was the fact that the average ST user was much more literate than, say, an average user of a PC clone. Also, the number of programmers (and some of them mighty good!) was surprisingly high for such a small user base. All those people (well, at least most of them!) were a real pleasure to interact with. As my experience shows, it's a dark, cold world out there among the clones.

Things started changing only when years kept passing and the hardware still remained the same: first, no longer cutting-edge, then just run-of-the-mill, and finally, let us face it, obsolete.

Then the developers moved on to more promising markets; it may be nice to be a big fish in a small pond, but not when the pond is drying out. Then more and more Atari ST users (and this used to be a crowd with a fierce brand loyalty!) started turning their backs at their loved-and-hated machine.

Then there was the year (was that '93?) when the annual DC area AtariFest did not happen. This was the moment when we could clearly read it on the wall.

At that time, my old (although beefed-up) ST was still more than adequate for most of my needs, with one notable exception: programming. Back in 1987, the compilers available for the ST were at least as good as those for the PC-DOS; in 1993 they were hopelessly behind. Too bad.

Where Are We Going Now?

Not really anywhere. A move from the ST to a Mac or to Windows 95 may be less radical than a move from DOS to Windows, or from Windows 2.0 to Windows 3.1.

You think I am kidding? OK, let's have a look at the different Windows versions. Version 1.0 was the mother of all lemons; even 2.0 would not do anything right: an empty desktop could crash or freeze without an apparent reason, and only Microsoft could afford such a blunder and still have millions of people buying their software. Version 3.0 was slow, clumsy, but already almost usable (at least for the people who knew only DOS before). The 3.1, on the other hand, behaves much more predictably (albeit slowly), crashes only occasionally, and—lo and behold!—it even allows you to copy a file by dragging its icon from one File Manager window to another. (Mr. Gates must have hired some young Einstein to come up with such a brilliant idea!). Certainly, hardware platform aside, a move from Windows 2.0 to 3.1 is quite a culture shock.

Many former ST users started their gradual migration some time ago, and from what I could see, my chosen path is quite typical.

I'm going to keep my old ST at hand to run the programs I like and know, and to perform the basic maintenance of some programs I wrote that people still use. I am also using the *Gemulator* on my PC-DOS machine at work (mostly to run my own *El_Cal*).

On the other hand, as soon as I can afford it (this means around Christmas 2005) I'm planning to buy a Power Mac. In the meantime, I keep most of my personal information on the HPI00LX palmtop (for which I also do quite a lot of programming).

For the time being, in order to meet my most urgent professional needs, just last month I bought a cute Toshiba sub-notebook with 8MB of RAM, 250MB of hard drive and a 14.4k PCMCIA card modem. This thing has the brightest, most contrasty, active-matrix color LCD screen I've ever seen.

With the Windows version of Borland's C++ and Pascal compilers, plus a word processor, a terminal program and some utilities, I manage to do most of the things I need, in spite of all I have to say about Windows. One day, I may even write a Windows version of *El_Cal*. Welcome to the real world.

Just now I am typing these words on a plane, somewhere half-way over the Atlantic, on my way to Poland and Germany. I am using the Hewlett-Packard palmtop to do

this (the batteries last 20 hours or so before recharging; all laptops go belly up after much shorter time). This weekend, I will transfer the text to my notebook and send it via the Internet to Joe Waters, just in time to meet the deadline. The amazing world of computing, but, sad to say, without the Atari ST.

A Goodbye to Friends

By far, the best thing I've got from my eight-year relationship with the Atari world are the people I met there. The first contacts were through the local bulletin boards; later came the *Current Notes*, which I enjoyed both reading and writing for.

Not only was Joe able to put together what I believe was the best Atari-oriented magazine in the United States, but he was also able (or lucky) to get the best readership for it. I am not just trying to be nice or polite, I mean it.

Some of you who are reading this now, who used to call from time to time, or to write me a letter, to send a piece of email, or to drop by for a short chat at the 'Fest, have to know how I appreciate having met you.

Then, another fun thing: writing programs for the ST, for people to use. Some of them were freeware, some—most notably *El_Cal* and *Star Base*—commercial offerings (with freeware versions available, as well). The commercial offerings, distributed by Dcbonair Software were, modesty aside, clean and capable programs I'm quite proud of.

The market for math and astronomy software on the ST was very, very small, but what a great crowd of customers we had. Although I never made any money on *El_Cal* and *Star Base* (well, just a little), I have met quite a number of friendly and knowledgeable people, with some of whom we are still in touch.

Luckily, money was not the main goal (it would never hurt, but my regular job is paying quite handsomely, thank you), and I don't think any software vendor ever dealt with such a bunch of good people. And besides, in the six years or so of Dcbonair's presence on the market, we got a bad check only once—and that was from a dealer.

We've had some good fun together, and this is something I'm going to miss. I would like you to know it.

Keep in Touch

The fellow ST users (or ex-users) who would like to contact me, can do it on the CompuServe (70611,2552) or straight on the Internet (wrotniak@umdhep.umd.edu), but no longer on GENie. You may also write to me at 2057 Happy Lane, Crofton, MD 21114.

As Dcbonair Software will have to fold its operations some time soon, contacting me directly will be the only way to get support for *El_Cal* and *Star Base* a few months from now. I will be glad to help with whatever I can.

These were great years. Goodbye.

Design Principles in the *Edith Professional System*

by Annus V. Groenink

Early in the summer of 1994, Henry van Eyken made a tour through the Dutch Atari scene to write his article, "Tiptoe, Through the Tulips." Small as this scene (or the Netherlands, for that matter) is, I was one of the people Henry honored with a visit. From the very first questions Henry asked me, it was clear that he had prepared for the interview better than I; Henry's "main dish" for the interview would be my answer to the following question:

"Can you give a precise account of the design principles applied in the *Edith* text editing system and its user interface?"

My views on the principal concepts of user-friendly, professional software should then give insight into current European views on software design. Although I immediately recognized the subject as something I could, in principle, make a good impression with, I found myself unable to give a brief and concise answer to what Henry thought of as the most important question of the interview. Once a teacher, always a teacher—Henry decided to give me the question as a homework assignment. This article is my submission to that assignment.

I doubt that a single person's ideas on software design can give a reliable account of "current European views." Looking at various European products (comparing German products to British ones for instance), I do not recognize any common features that would give rise to the idea of a general European look and feel. From a North American point of view, however, there is probably precisely one such feature: the software definitely does not feel like any American product. But that is clearly not the type of observation *Current Notes* readers are waiting for. All I can do here is try to give an account of what general rules I have learned and applied in the four years of development, that have led to the *Edith Professional* text editing system as it is available today. What follows is an entirely personal view.

Henry has written a review of *Edith Professional*, published in *Current Notes*. Although this review is generally enthusiastic about the abilities of the program, Henry severely criticized the accessibility of its features for the non-professional user. This is remarkable, because my chief motivation to write *Edith* has always been to provide an application that makes the most recent and advanced technology available to a

user who is not prepared to spend half the time learning how to get things done.

Therefore, I must conclude that it is, in principle, impossible to combine a wealth of professional features with ultimate user-friendliness. Nevertheless, it is still my opinion, and also that of many of *Edith's* users, that the *Edith* system is more than a fair compromise; certainly compared to other highly advanced editing tools, the most notable of which (not in the last place for its steep learning curve!) is *Emacs*.

About Hoovers and Software Engineering

Software is just like any other household device—it is what it looks like, and nothing more than that. A bicycle has pedals and a handle bar, a CD-player has "play" and "stop" buttons, and it is by these "controls" that users recognize their use. The very same holds for software, though it is much harder to find a simple representation for the numerous complex operations a software package provides to its users.

Most of today's software is somewhat like a CD-player that requires a screw driver everytime a disc is to be played. It is this essential observation—a fundamental dissatisfaction with existing products—that is basic to the developer of honest, user-friendly software. Therefore, when developing a software product, the user interface is always the point of departure. In first year computer science classes, one learns that the basis for every computer program is laid on paper: first, decide what a program is to be capable of, and then write a program that does precisely what is required. One must never simply start writing and see what turns out. What is never mentioned (though it is equally important), is that any computer *application* starts in drawings. It is not a good idea to start writing your software, and later decide what it is going to look like on the screen. If anybody, other than the programmer himself, is to be able to make use of a computer application, the essential question is *not*, "what should my application be capable of?"; the question is, rather: "what 'controls' should my application provide to its users in order to be a useful tool?"

That's the theory. In second year computer science projects, one learns that an effective interface for a program is also designed by making prototypes. The

prototypes usually point out difficulties that could not have been predicted if a full design had been made only on paper.

So the right way to do it is to make reasonably concise plans on paper, realizing that the exact look and feel will change as the product is being developed. The Edith text editing system is a good illustration of this process, as both a very early version (the shareware V1.0 that is now free) and the final product (*Edith Professional* V1.221P), are available to the general public.

As Henry van Eyken has already pointed out in *Current Notes*, "*Edith Professional* is today vastly different from the pre-release version 1.0." Looking back at the last four years, I think one of the virtues of the Edith project is its long history. Ever since *Edith* became available in shareware form, endless feed-back from users has transformed the application into precisely that which Atari users expect from a text editor. A second virtue is in the fact that it is a text editor—there is no application a programmer depends on more than a text editor. As a programmer, therefore, I had a unique insight into the perspective of the end user. I also consider myself more representative of the average end user than most computer programmers, as I tend to dislike programs that do not look nice or which require the user to remember large numbers of key combinations.

So let me try and summarize the key concepts that I have learned to appreciate as essential to the development of an outstanding, sound product, while writing the one large application into whose development I have put four years of my life. I shall illustrate some of these items with examples indicating how these are reflected in the *Edith* system. As I said earlier, many of these examples make sense for any product, such as a car or a stereo.

Six Arbitrary Guidelines

1. *The product must be conceptually different from anything else currently available, i.e. it must be exclusive.*

Fundamentally, it must attempt to be both easier to use and more powerful than any comparable prod-

uct. Programs of one developer should radiate a particular "personal touch," which immediately identify the product. Henry recognized this striving for exclusivity or character in his review, by saying *Edith's* author "expresses more unconventional ideas per kilobyte of code ..., than any other mortals in the biz would dare to send off to the marketplace."

2. *The product must be elegant and attractive in appearance, and it must be pleasant to work with.*

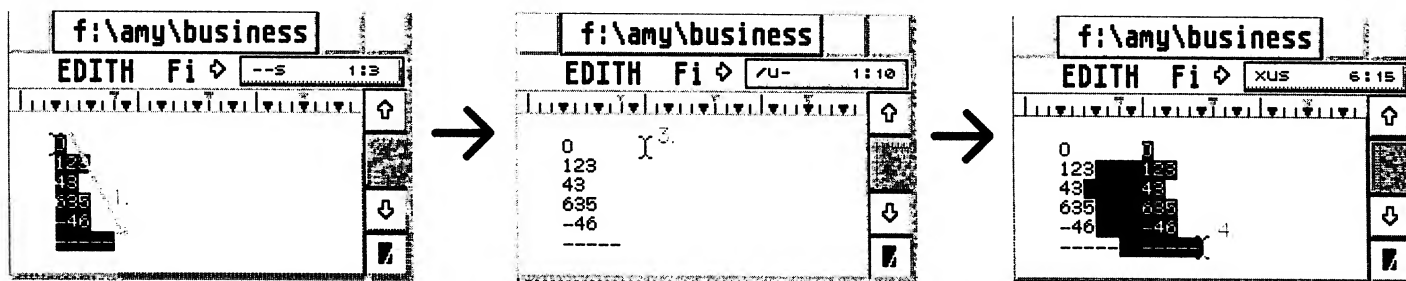
Therefore, it is extremely important that it look as good as possible (colors, 3d!), and not bother the user with questions that could possibly be resolved without the intervention of the user. *Calamus SL* always asks the user whether its contents should be saved or abandoned, even if they have just been saved. Neither 'save' nor 'abandon' are really appropriate actions.

3. *The operations the program offers must correspond closely to what the user has in mind, and if possible, make the user forget that he is working with a computer.*

Here are two illustrations:

(a) the possibility to cut, copy and paste rectangular areas of text: if I can copy a paragraph, then why can't I copy a column of text, or two pieces of text at once? The operation of copying a column of text and pasting the entire column back somewhere else is a good example of an operation that to the user seems very simple, but is much harder for a computer, since a text is typically treated by a computer as a linear stream of characters. It is the task of the programmer to take care of a good correspondence between what the user thinks of as elementary operations (including treatment of rectangular selections of text), and operations that are indeed easy to perform.

(b) The Mac-style cut/paste system may be a great improvement over block copy functions in text editing systems from the pre-Windows era, but it is rather mysterious in that a text block that is 'cut' out of a text is stored somewhere in computer memory (usually called the cut/paste text buffer), and, as such, is invisible, until the user elects to insert it somewhere else. This is an example of a situation where the user must have an understanding of a computer's



1. Move mouse while holding down right mouse button 2. Copy (Ctrl + C) 3. Move mouse to desired position 4. Overlay (Shft + Ctrl + V)

Figure 1. A rectangular cut and paste operation.

internal concepts to understand how to use a computer application.

It is precisely these "computer-internal" concepts that take time for the user to master. Although the complexity of the *Edith Professional* system introduces many concepts new to the average user, it also tackles some of the older problems that have been around for some time, such as the invisibility of the cut/paste buffer; this is what the *Edith* ads refer to when talking about "full visual representation."

The *Edith* system offers, in addition to the standard cut & paste approach, the ability to copy text blocks by dragging pictures of the text blocks between text windows and the Clipboard Panel which continuously shows the contents of the cut/paste buffer. This corresponds more closely to the way the user thinks about text organization. It turns out that even experienced users revert to drag-and-dropping text blocks whenever many copy operations are to be done, or whenever more than one text block needs to be used and things get too complicated to remember (see figure 2).

4. The product must be consistent, or orthogonal.

This is best illustrated by an example: if one error results in an alert box, and another error simply results in a 'beep' sound, this is not consistent; or computer scientists say, not orthogonal. If the scroll bars in a window give the user a rubber box, and the scroll bars in dialogs are opaque (text moves up and down immediately as the slider is moved), this is not consistent. Such inconsistencies make an application hard to understand.

An example of improved orthogonality in *Edith*: traditional text editors provide SEARCH and SEARCH AND REPLACE commands. The user may object to this, because it is fairly natural to first search for a given string, and only then decide to replace it. But a single replace operation usually doesn't exist! Therefore, the *Edith* system provides separate search and replace operations. Search to mark all occurrences of a string in a text, and replace to replace all the marked occurrences in one go. Since search + replace = search & replace, this orthogonal approach provides one extra operation (replace without search) for free. This new operation turns out to be useful also for purposes other than search and replace, such as a series of manual replacements.

5. A program should avoid situations in which the user can make mistakes.

But safety measures should not get in the way, so the program must be friendly to a user who does make mistakes. Examples in the *Edith* system are:

(a) In many text editing applications, performing SEARCH AND REPLACE ALL, is a dodgy enterprise. When some strings turn out to be replaced that should have remained the same, one usually has to revert to doing things manually. The UNDO function in many Atari applications can only recover the last string that was replaced. A rather rigorous solution to this problem is to always save a file before doing a global search and replace.

In the *Edith* system however, the MULTIPLE SELECTION/BLOCK facility allows for a replace operation that can be inverted. Therefore hitting UNDO af-

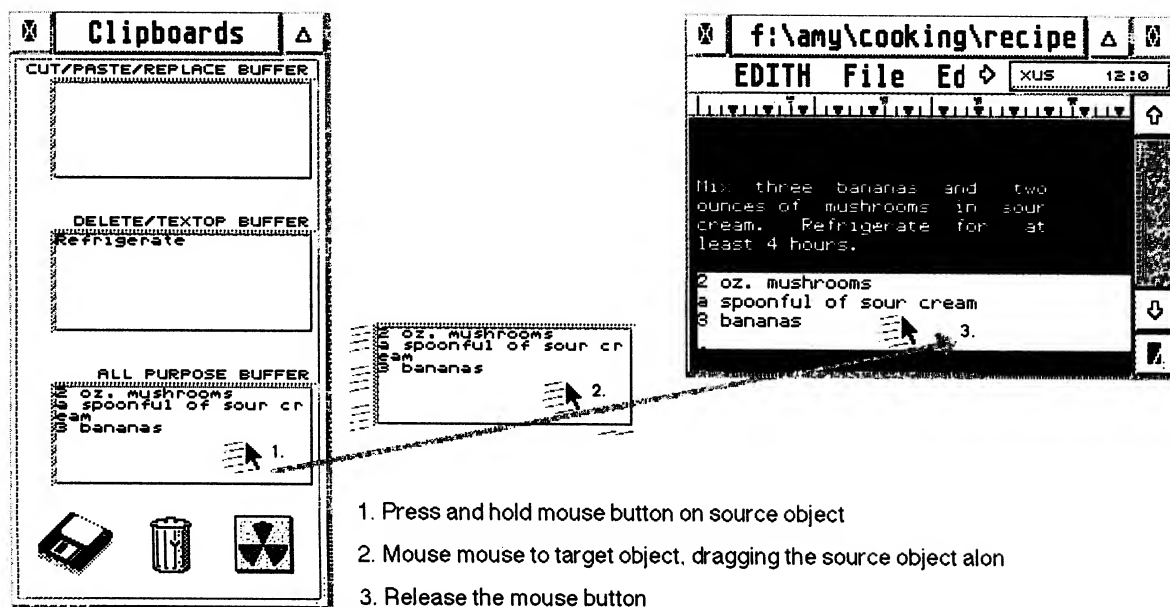


Figure 2. Drag and drop with text buffers.

ter a global replace, recovers all the replaced strings. Furthermore, since SEARCH ALL and REPLACE have been separated, there is the additional possibility of previewing all the strings that are matched, and only then decide to choose REPLACE.

(b) A problem that often occurs when editing text, is that one recklessly deletes a paragraph, to discover later that some of it wasn't as bad as it seemed. However, the copies on disk don't contain that old information. It must be laboriously retyped. To overcome this problem, some text editors allow the user to UNDO everything done to the text since it was last saved. This is not entirely satisfactory, since hitting UNDO 30 times may destroy sensible information added later.

In the Edith system, a TRASH CAN contains everything the user has previously discarded. Its contents can be opened into a window, allowing the user to browse through the text he has previously thrown away. This allows the user to be faster and more reckless, as anything he loses can later be traced back in the trash can.

6. Innovation is essential, but must have a simple justification.

It is easy to build powerful applications loaded with features, but if users cannot easily recognize their use, the application will be useless. An example in the *Edith* system are the operations PUSH POSITION and POP POSITION, one of Edith's features described by Henry as being of a highly professional nature and hardly accessible to novice users.

Most text editors allow the user to put MARKERS inside a text. There is usually a maximum of 4 or 5 markers, identified by numbers. Instead of remembering a text position (by line number, for instance), the user places a marker and remembers its number instead.

Edith has one "collection" of markers, in the form of a stack. The PUSH operation adds the current cursor position to that stack. The POP operation returns to the position which is on the top of that stack, i.e.: the last position added to the stack using the PUSH operation. The most common use of this function is the following: when typing at the end of a text, the user decides to make some changes to a paragraph a few pages higher. The user selects PUSH, walks up to that paragraph, makes the changes, and then selects POP to return to the point where he was working.

So 'push' should be thought of as 'memorize,' and 'pop' should be thought of as 'go back to where I last worked.' Doing 'pop' twice then means 'go back to where I worked before that.' Push and Pop are not limitless, but they provide a huge amount of practical control. And you don't have to remember marker numbers.

Conclusion

In his review of Edith, Henry van Eyken stated that, on the one hand, *Edith* introduces many novel ideas, which lead to great editing power, but, on the other hand, make it a software package that is hard to master. The illustrations I have provided show that many of the novel ideas in the *Edith* system not only improve its power, but also its understandability and ease of use for the computer user with an open mind and a little patience. This is very much like an electronic calculator (perhaps more like one of those HP calculators with an 'enter' button, which is essentially the same as the 'push' and 'pop' system). To someone who has never used a calculator, it is more of a pain than a relief; but when one gets used to the electronic calculator, life invariably gets a little easier. Getting used to *Edith Professional* will definitely make your programming and writing much easier!

[The author has a research position at the Centre for Mathematics and Computer Science in Amsterdam and is working for a PhD degree in Computational Linguistics. He is also the chairman of ZFC Computing/Media and the author of the *Edith Professional* text editing system.]

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Atari in the STicks

Henry K. van Eyken

Computing to a Purpose

*The more I know
the less I want to know it*

-- Chaplin

& this, then, is it. The final issue of *Current Notes*, along with this final missive from an STe in the STicks.

The end did not come suddenly and my mental transition shows in last issue's *Palmtops at my Fingertips*. Its description of Hewlett Packard's 200LX Palmtop brought me back to just about where I began my journey a decade ago when contemplating a 0.5-K Radio Shack pocket computer in the wake of what the wristwatch has wrought:

"Fleabyte is my term of endearment for the pocket computer or, for that matter, any programmable computer that can be carried on the person about as comfortably as a watch or a ballpoint, a wallet or a pocketknife, a handkerchief or a pair of glasses. Like all these small and so useful articles, Fleabyte is there where you need it, when you need it."

"That miniature, the wristwatch, has revolutionized man's daily life more than the clock ever did, and one would expect that other miniature, the pocket computer, to do the same. It, too, is bound to evolve into a lifetime companion. Given that opportunity, it will increasingly take charge of many routine memory and thinking tasks and, thereby, free the neural brain for occupations of greater interest. We may all have a chip on the shoulder one day."⁽¹⁾

Current Notes may not have enjoyed unrivalled renown across five continents and the seven seas; nevertheless, it did provide me with an opportunity to review personal notions under public scrutiny; notions, primarily, about the possible role of private computing. What benefit might it, could it, would it bring to individuals? What to society? No, I didn't expect, nor did I get, much feedback. But just the same, the very act of writing has helped me to educate myself, if no one else, a little on the subject.

A full range of activities in private computing still requires, also, a computer larger than what fits in a pocket and there is little reason to abandon my STe other than that it puts severe limits on enjoying new developments and experiences available to those in the mainstream. On the other hand, it should serve me quite well for trying out homegrown programs to test notions I have about private computing.

Fleabyte

At the time of writing, this last week of March, I am completing and uploading to GFnie some improved versions of my Fleabyte calculators. Earlier versions have been removed so as to leave a cleaner legacy on-line. I may well continue the process if supported by feedback. Who knows? There might even be persons desirous to participate in the project! Without response, however, there seems little point in doing so. To me, the world of Atari doesn't end with the shutting down of the machine's production; it ends when an enjoyable, symbiotic relationship with fellow Atarians ends.

There is no dearth of interesting development to tackle. I have just begun letting the calculators apply formulas drawn from a library the user may create, see figure 1. And the *quick.focus* spreadsheet feature is begging for sensible development.⁽²⁾ A model that automates the use of units from various systems of measurements is nearing completion, see figure 2. A fellow Atariian has suggested a slight modification that lets Fleabyte perform on TT and Falcon machines.⁽³⁾ On the downside of the project: I haven't the foggiest idea about what use is made of these tools, what users think of them, and what problems they encounter.

The accessories are programmed in GFA BASIC because I feel that ordinary users should be able to modify programs to suit their own needs and/or tastes. Thus, I express hereby again my belief that programming skill should be part and parcel of ordinary competency. But, in the same breath, I must admit also that, as an amateur, I myself encounter difficulties with programming. These comprise some technical difficulties, cf reference 3, and organizational difficulties: how to organize one's work, how not to mix up fragments of versions, how to adequately judge one's work in the service of others. Clearly, there is some good, objective-focused work to be done here. The literature I have encountered (and have had the time to delve into!) is inadequate. That is understandable, considering that computing is still a field mainly worked by technocrats. One may doubt the problem can be adequately addressed in the world of Atari, but somewhere, somehow, it begs for a satisfactory solution.⁽⁴⁾

1. v.E. *Pocket Computers in Education: The Very First Original Fleabyte Course*. Course for educators given under the auspices of the University of Sherbrooke. 1987 1989.

2. v.E., "Fleabyte Fundamentals: Their Spirit and their Substance," *Current Notes*, May 1994, p.52.
3. There is still some problem with the Falcon's 480-pixel vertical resolution. This may be a small matter for one in the know, but it is a conundrum for this amateur who has no time to decipher a great deal of gobbledygook often to only find out that additional funds and time need to be spent on this or that or some other thing.

Figure 1 — Forgot the formula, or is it too cumbersome to enter it? These steps show how to calculate the volume of a cylinder without remembering the formula. Typing a semi-colon generates the query: word? Usually a letter or so to the wise will do; here a v for volume and cyl for cylinder, but if you don't remember the spelling of cylinder, typing v lind or something like that will do equally well. When the label and formula appear, type in (with a space between them) the values for the tagged (') dimensions, r(radius) and height. Pressings of the return key replace symbols by the values entered and the calculation is done immediately. Though the method still needs polishing, there hardly seems a simpler way on the horizon.

word?	dictionary	8:41 pm
full-function [3.2f]	[e for info]	[wh:e] [M:\] [rad] [dec:+6]
word? v cyl	dictionary	
full-function [3.2f]	[e for info]	[wh:e] [M:\] [rad] [dec:+6]
volume cylinder; pi * 'r^2 * 'height	dictionary	
full-function [3.2f]	[e for info]	[wh:e] [M:\] [rad] [dec:+6]
3 5volume cylinder; pi * 'r^2 * 'height	dictionary	
full-function [3.2f]	[e for info]	[wh:e] [M:\] [rad] [dec:+6]
5volume cylinder; pi * 3^2 * 'height	dictionary	
full-function [3.2f]	[e for info]	[wh:e] [M:\] [rad] [dec:+6]
volume cylinder; π * 3^2 * 5=	fleabyte.ff	
		141.371669

Figure 2a - Fleabyte for engineers. Here units are converted to the metric system. Choice of absolute or gravitational; S.I., c.g.s, or the English system of units. (Job being completed.)

15000 ft^3 * 60 min/hr * .07644 lb/ft^3 /13.28 ft^2=	fleabyte.bns	
		421.5505668583 kg/m^2

Figure 2b - Fleabyte for horse traders. How many palms to a meter? Ask palm?/m and you shall know. There is plenty more where this came from.

palm?/m=	fleabyte.bns	
		13.12335958005

Abstraction

The question may well be put, what are my jollies in all this? In this final article for *Current Notes*, therefore, I like to touch on some components of my views on computing to a purpose. Some of the whys and hows. You may find these components shockingly disparate and, hence, wonder about the sanity behind it. For myself, I don't look at computing in isolation. Besides being *one* interesting pastime, I view it as a means to an end that is bound up with my propensity to integrate experiences gathered during my sojourn of nearly seven decades on this planet; to assemble them into simpler wholes that may offer insights of where solutions may possibly be found rather than stuffing for impotent indignance. *Systems thinking*, if the term is not too grandiose.⁽⁵⁾ This short article is followed by *Lesson from Leo*, something I wrote years ago. *Lesson* is a triptych of three different, yet very much related, experiences and reflections. I hope you won't find them too abstract.

Lesson from Leo does not touch on computers. To me the three parts and how they connect have something to do with essences or follies of being human. They reflect on human impotence and depict ways by which we make our escape from moral reality by refusing to see facts, or denying them, or worming our way around them. We are burdened by knowledge rendered impotent by ignorant minds, knowing

without a star to steer by, knowing of the sort that forever makes history repeat itself, a very sad state of knowing.

Modern communications technology chokes us with such knowledge. We may watch it on TV while partaking of a meal. Much of that knowledge is shredded and disinfected or sanitized by layering it between scrapes with nimble cars and sanitary napkins forever more absorbant. And what we miss on TV we read about in the papers: organs pulled from live prisoners for medical transplants, the cutting of throats and other techniques of ethnic cleansing in Bosnia, baby murder in India and street kids murdered in Argentine, child molesting and wife beating on the very blocks where we live. Yet, long histories of civilization, of highly touted cultures, and of democracy fail to deal with these problems. We simply don't know how to address them. Knowledge, knowledge everywhere and not a drop to drink.

Democracy gives ordinary citizens the feeling of participating in the governance of their affairs. I don't remember former president Jimmy Carter's exact words, but this statement of impotence is his. By it he clearly and realistically delineated the scope of democracy in societies thickly packed. I perceive that the impotence of ordinary citizens is increasingly shared by those elected to take charge. With all the resources of government at their bidding they, too, lack useful, timely and applicable knowledge.

From antiquity, the word *power* in that old adage, *Knowledge is Power*, is the power to hold sway over fellow human beings. The requisite knowledge, not unlike today's secrets of state, used to be garnered and guarded by priesthoods thousands of years ago. More recently it has come to mean making one's way and standing one's ground. Today, with knowledge exploding beyond the bounds of comfort, it is clear that

4. One big stride toward a solution: Hans Kempen's "Your 2nd GFA Manual," GENie ST library, #31375: EXTRA.ZIP
5. e.g. v.E., "Changing Minds." *Current Notes*, October 1993, p.20. "A Systems View of Language." *Current Notes*, March 1994, p.51.

power resides less in knowing facts than in knowing how to interpret and utilize facts.

With writing and printing, power has come to the people by the distribution of scripted knowledge. The first two of the three Rs are those for reading and writing so individuals may access and spread information. Computers enable us to make the next stride. Besides locating, accessing and filtering desired information, computers enable us, in principle, to interpret information, to have information make sense in appropriate contexts, to examine alternatives, and to decide on action. We can even go overboard by making our computers a bit too trigger happy, as we belatedly observe the computer-driven stock market crashes.

If we, ordinary citizens, muster the savvy, we may well learn to use our computers to make democracy strike an equilibrium at a higher plateau than what human turmoil dynamics permits today, an equilibrium more for the common good and to our liking. This, it seems to me, ought to be the primary purpose of computing.

Our Other Half

One way of coping with the moral problems of modern life is to swamp one's mind with one's intellectual specialties. For most of us, that means giving ourselves over to the activities of the left side of the brain and thereby ignoring the qualms of that other side, the human, the not so technologically savvy, side. Our allocation of work to these two halves is a point I hoped to dwell on a bit in a future article for *Current Notes*. Instead, I shall just list below some of my sources.⁽⁶⁻⁸⁾ Tersely put, I would just hope that by letting computers take over preoccupations of the left, we can be more attentive to the emotional aspect of human interactions. That is my thesis. This thesis is yet to be properly posed and defended; for now, then, I take it as a postulate, a reasonable proposition.

A second postulate is called for as well. Unfortunately, it is more dubious. It says that if we pay heed more to the right side of our brain, we shall become better human beings. A little dicey, isn't it? But hardly something to worry about if we can't make it beyond that first proposition. That first postulate, therefore, is the one to concentrate on.

One of the less satisfying aspects I have found in the few discussions of machine intelligence I encountered is the over-

looking of that left-right duality (as well as the vertical integration of the so-called triune brain) in the human psyche. Maybe I am naive, but I can only associate proper use of computers with the left-hand side.⁽⁹⁾ And so there is something about that famous Turing test that leaves me edgy. No, I am not quarreling with the statement, Mr. Turing was too bright a guy for me to quarrel with, but it leaves me unhappy. For brevity I put that test here in a form that may make it a little easier to grasp than I found it in my source.⁽¹⁰⁾

9. Philip N. Johnson-Laird, *The Computer and the Mind*.

Harvard University Press, 1988. Computational models, even for such seeming abstractions as self-reflection, free will and intentions, needs and emotions.

10. Ordinary reading, it has been reported, is running into trouble. Books are too numerous and too ponderous. Readers demand short-cuts. The Nobel-prize winning Russian poet Joseph Brodsky once suggested we abandon prose for poetry because poetry makes every word count. Here, check it out for yourself for it so happened that in some unconscious anticipation of Brodsky's comments I shortened this description of the Turing Test:

"Picture yourself in a room that is empty except for you and a computer terminal. In a similar room, hidden from your view, are a man and a woman with a terminal similar to yours. You communicate with them by typing questions on the keyboard of your computer. As you type, your questions appear on the screen of their computer. They respond to you by typing on their keyboard, and you see their responses on your screen.

"You are the *interrogator*: you can direct questions to either Person A or Person B, but you do not know which is the man and which is the woman. The object of the game is to try to guess which person is male and which is female solely by analyzing their responses.

"If both people were obliged to tell you the truth, you could just ask, *Person A: Are you male or female?*, and the game would jerk to a screeching halt. But in Turing's game, only one of the people is obligated to reply truthfully; the other person is actively engaged in attempting to fool and confuse you, using any deceitful tactics that will make you guess incorrectly.

"How would you fare as the interrogator in the imitation game? How often would your incisive questions enable you to sort out the genders of Persons A and B correctly? How often would you be fooled?

"Next, and this is the critical part of the Turing Test, substitute a computer for one of the people. Now the human is obligated to give you truthful, human-like responses; but the computer is trying to fool you into thinking that it is human!"

....

"Turing's point is that if your success rate in the computer/human version of the imitation game is no better than your success rate in the male/female version, then you might as well say that the machine is thinking. That is, the machine is at least as intelligent as the human."

6. R. Joseph, *The Right Brain and the Unconscious*. Plenum Press, 1992. As most readers will know, what is left for most of us is right for the rest, and v.v.

7. Daniel L. Alkon, *Memory's Voice*. Harper Collins, 1992. A fine, personal integration of neuro science and being human.

8. Jerome H. Barkow, Leda Cosmides, John Tooby, editors, *The Adapted Mind*. Oxford University Press, 1992. Evolutionary psychology may give us an insight in where we may improve ourselves and where not. After all, we are not free from our evolutionary past.

Turing's Test For Computing Machine Intelligence

*A room that's empty
but for a keyboard and you.
And another room
with a man and a woman
and a keyboard same as yours.*

*Your typed questions
show on their screen
as their answers
do on yours.
One of those two may lie,
but th'other is bound to truth;
and you must guess
the gender of who responds.*

*In this game -
not known by you
a computer replaces the liar.
Then, if your guesses become
not better and not worse,
is that computer's mind
not like that of Man?*

Besides Turing's point, I know, but should we ever expect or wish a computer's mind to be like that of Man? Isn't that right side the domain to be defended tooth and nail? Isn't that, but for ingested chemical insults, the very minimum, the

absolute bottom we have for still being human?⁽¹¹⁾ Thus, my thesis is that the computer will be beneficial by taking over work from the left side, so we can live more by the right side. It is a thesis that runs parallel with our notions of family values and community spirit. The value of those human relationships encapsulated in our brain.

*A story has
a beginning,
and a muddle,
and an end;
and the aim of the muddle is
to grow beyond the end*

And, thus, the time has come to say farewell to Joyce and Joe Waters and to my fellow writers for and readers of *Current Notes* as we shall muddle on in our separate pastures. It's been a good time to remember.

Pulex vobiscum⁽¹²⁾

11. As evidence there is more to contemplate than I brought out take this quote from R. Joseph:

"In gaining greater control over one's life, it certainly can be useful to understand the roles of the right and left brain and the limbic system, the interactions between the unconscious Child and Parent, the deceptive uses of language, and the defense mechanisms."⁽⁶⁾

12. *Puce*, Fr, flea, computer chip. *Pulex*, L, flea. Hence, by extrapolation, *pulex exiguus* = microchip.

Lesson From Leo

(About History In Schools)

1. Children's Play Under the Nazis: 1940

Leo Stern's house was a wonderful place to play. Rooms without furniture gave us the full reach of their greyish-brown planken floors. His parents were occasional, ghostly glimpses who never scolded us. I think they were his parents; they must've been, they lived somewhere in that house. They just kept out of our way. Or, maybe, I was kept out of theirs. Leo differed from the other boys I knew. Short and scrawny he was, with curly hair, dark brown. He was nice, had a small voice, and liked to play indoors. He had a touch of that same strange accent as the window washer in white coveralls who had lived near our house, above a corner workshop that had a big sign on it with *Cemco N.V.* or some name like that. He, the window washer, was German; the boys in the street had said so. That meant you'd better watch out. He did house-painting, too, and he had painted our front door a glossy brown with stripes to make it look like new wood. It was downright ugly.

N.V., I had learned, meant *Naamloze Vennootschap*, literally, nameless partnership, which is *Limited* here. The abbreviation left a significant impression because I didn't understand it, even when told the words it stood for.

That window washer/painter had disappeared not long after the five-day war. The older boys, who knew much more than I did and everything always better, said he had been a German spy. I did not quite know what to make of that except that anybody had the right to shoot a spy because he was like a *franc tireur* who hides in the crown of a tree and aims his rifle at anybody.

Leo and I had been classmates for some time before the invasion, but we were not buddies then. Boys with a religion were usually not allowed to play with boys like me, who were said to be *nothing*. I had relatives with religions, and some still went to church. On my father's side they were Catholic. *R.C.*, they were often called, rather smudgingly. I also had an uncle who practiced being a Protestant because he wanted a promotion at City Hall. He never visited us.

Leo showed me once some special building that marked my imagination. It had strange letters over its front door, letters never seen in school. It made me feel unsure of myself, a little empty, perhaps. *Hebrew*, he said. He must have said more than that, but all I recall is a faint whiff of pride. Pride of lineage, I'd say, of being more than just there.

Before the German occupation, I played a lot with the boys in the narrow streets near our house. Mostly, we played war. Martien, whose parents were NSB'rs (Dutch Nazis by children then not yet seen as traitors) and who had a toy store with Marklin trains and lots of toy soldiers, was the leader because he was the biggest, played a dented bugle, and out-talked us all. He also wore a black military kepi and that, he said, made him president, which is even higher than captain. I was no hero in those games, but I couldn't refuse to play along because of my red hair and freckles and steel-rimmed glasses, three formidable liabilities:

*Vuurtoren, vuurtoren zonder licht,
rood haar en 'n pestgezicht.
(Lighthouse without light,
red hair and an ugly face.)*

or

*Brillejood, brillejood!
(Spectacled Jew!)*

Even adults sometimes called me *vuurtoren* or *brillejood*. They didn't mean to be mean; they only wanted something to say. Silence is so dumb. But with *them* calling me names, imagine the boys! Their words hurt more than a fist in the face or iodine tincture in a bloody scrape from the rough paving bricks. It was much better to belong with the gang and fight when told to, with fists clenched and eyes mostly closed, while the leader stood above it all, on an old packing crate, issuing his orders.

Leo and I met again long after the German invasion. It was in '40 or '41, I guess late in the fall, it must have been, because the crowns of the old elms in our street were bare but for a few dead leaves still hanging on. Leo had nobody to play with at that time, and I then had hardly anybody either, having just lost a friend, a *katjang*.⁽¹⁾ He liked my old radio parts, which had many beautiful green spools among them, and we pretended to build real radio sets at which he showed clear superiority and leadership. We tuned in to one another's sets, which we manned in separate rooms, and talked without seeing each other. I loved his place. What better reason for being friends?

We weren't buddies for long. One day Leo came over to my house to say that he was going on vacation, by train, through Germany to the East. My father wished him well and gave him a dime. I felt the pang of envy. Why did he have all the luck?

* * * * *

1. *Katjang*, a somewhat derogatory word for people of mixed (European and Indonesian) blood.

2. On Fritz' Farm: June 1989

Recently, I attended a meeting of college chemistry teachers or, rather, half of that meeting. It was a hot, sunny day and I spent much time outside on the lawn of Fritz' Farm, a suburban community property on Montreal Island where the event took place.

I had a pleasant conversation with a colleague, a lady who bubbled with enthusiasm about teaching and research, a love for students and for chemistry, organic chemistry especially. We talked about other matters too for, clearly, she had given thought to many things. And then, so abruptly I have forgotten the context, there it was again, utterly out of place, that question never ever heard until recent times and which now keeps popping up too often: Do I believe the holocaust actually happened? And how do I know that for fact?

Yes, of course I know it happened and said so. I didn't say that any doubt on that score strikes me as obscene because that is a personal bias. Nor did I mention my experience on some other sunny day, in 1946, a year after the war. It was in a former Nazi transit camp where Leo may well have stopped over during his last vacation. I was shown a man-made hill, one of a few, if I remember well, and it was covered with immaculately shorn, green grass. One side, shovelled open, was a wall of human remains; bones laced with decaying tissue, brownish grey; an emptying head standing on guard with silent grimace.

Neither person nor circumstance contradicted the sincerity of her queries. But I was stumped. How could I, right there and at that very instant, provide convincing proof that the holocaust is fact? Just what sort of proof does one carry around on a fine, sunny afternoon, comfortably seated in the shade of a tree on a verdant, suburban lawn? Then I thought of Leo and his dime and of those battles fought on a pavement of bricks so badly chipped.

She accepted my response as far as it went. The question, I am sure, had not been posed for sake of argument, as had happened before, to caution me against exaggeration, or to darkly allude to some sinister plot. Perhaps it was the innocence with which it was put that surprised me.

As I said, it was a warm day. Had it been cooler I might have been more astute. I must remember this for the next time. Then I may point to filmed records everybody must have seen by now, films of the living dead, skin to bone, found in the Nazi camps at the end of that war. But then again, how naive a thought it was in a world equally adept at falsifying or denying a historical record as it is at compiling it.

* * * * *

3. History to a Purpose (July 1989)

Wise people learn from experience and call it history if the experience is communal. Good, useful history, it is my sense therefore, should be a body of human experience that is credible and easy to draw lessons from. I don't believe this is

a novel notion; I imagine that, for example, much of the Bible was designed with that very idea in mind. At any rate, well-informed people, knowledgeable about the past and skilled in its interpretation, are more likely to take a critical view of events and the undertakings of their elected officials. Knowing and understanding help focus interest. They give backbone to conviction and, hence, strengthen democracy. They give power to a people who, by use of reason and well adjusted sense, can make their weight felt, which *is* democracy.

But most people (and you may well count me in) neither know nor understand history well. The same goes for its tail end as well, current affairs. A poor hold on facts, insufficiently cultivated powers of interpretation and of weighing evidence, plus an inability to foresee possible outcomes make us vulnerable to misleading information and to the mismanagement, political and administrative, of communal concerns. Add to this the rapidly increasing quantity and complexity of information plus the techniques and ethics of its use, and it is understandable that we, ordinary citizens, are not at all well equipped to keep abreast of important issues and, thence, hold in check those seeking to abuse this sorry state of affairs.

Clearly, with history I cannot mean the *verkrampte*,⁽²⁾ regional kind with its veneration of national heroes and spite over battles lost, the gorging on glorious exploits and the eschewing of what may hurt pride. Not that somewhat blinkered history comparable to what I had in school, a hefty dose of nationalism stirred in with makeshift objectivity and spiced with a pinch of rah-rah-rah. That sort of history is for forming a fan club for the nation, not for educating a thoughtful citizenry. That sort makes the fare for a pitifully bad museum and supports no worthwhile continuum for the future. No, not that. And schools should no longer overlook the obvious fact that humanity shares one world, one single, solitary Mother Earth, *La Terre de tous nos aïeux*, land of *all* our forbears, a fact that must be doubly evident in countries with large immigrant populations.

History, too, has its ecology. Its major lessons arise from circumstance and confluence. Many forces powered the holocaust. Active forces that willed it and designed it; passive forces that allowed it to occur ("I don't want to get involved"). Among the latter we find the fatal viruses of ignorance and, worse, of tribalistic nationalism, that alluring notion of clannish superiority with a sense of security for those who *belong*. In the case of Nazi Germany, that tribalism honed to racism dwarfed even nationalism in power and status, and the tribal flag was made to prevail over the country's. It is well to be wary of a flag that stands for an idea more than for a country.

Although a national spirit, like any team spirit or community spirit or regional spirit, may well have positive aspects in today's competitive setting, we must not merely stare at local eddies in the flow of time, but observe with greater inter-

est the torrents of larger events. Preparing for the needed altered state of consciousness must be a primary task of parents and of our schools, which means it must be, *must be*, uppermost in the minds of today's educators.

Team spirit inspires team work. Community spirit unifies people to preserve a precious, public good. But in marshalling such spirit it is well to give thought to just what is really important and what isn't as much, because by focusing sharply one thing, other things, often far more important things, become fuzzy or drift from sight altogether. Choices may be hard, the price of choosing often high. What comes first, say: patriotism or ideological issues, or a burgeoning economy? Economy or survival of ourselves, of others? Survival or ethics?

Community spirit must be the unpoliced outcome of understanding, of reason and of sentiment, both founded in true facts, and a sense of belonging that comes from positive interactions throughout a whole community. Certainly, it should not be the product of propaganda or coercion, the warping or putting out of context a vital element of democratic education, the history lesson.

Students should learn to be alert to any situation that may entangle regionalism or tribalism with malevolent purpose and, especially, learn to recognize demagogic incantation for what it is. Cultivating such alertness should be a vital component of a healthy program of instruction in human history, a program whose content would emphasize the evolution of the fruits by which one knows Man and how they affect human wellbeing.

History should emphasize interpretation in terms of our human nature, of which it is so much a product. Call it the *Ascent Of Man*, if you wish, but don't shy away from downturns, such as the Nazi holocaust. Do not inculcate misplaced optimism. "For almost nine hundred million people, approximately one sixth of mankind, the march of human progress has now become a retreat," observes the 1989 annual report of the United Nations' Children Fund. This is a way of stating that a new and global holocaust, this time around due to Man's fertility choking Man and due also to his overwhelming disregard for Nature, may well be underway.

Once more, history ought not be built on stereotyped friends and foes, but on experience which is to be scrupulously interpreted in terms of human nature, which itself is a product of Man's triune brain with at its heart the indelible imprint of an influential darker self. In such an education the events that gave rise to and sustained the holocaust could be and, I suggest, should be an important object of serious contemplation, not merely lest we forget, but lest we forget to learn from it.

A good program for the study of history must show, and critically exemplify, how historians gather and weigh evidence. History without evidence is like math without proofs, science without observations. If already there are people who doubt the holocaust ever happened within the lifetime of victims and other witnesses, then the sum total of human history, everything we ever have read or heard or seen on the tube, is

2. *Verkrampte*, South Afrikaans for narrow-minded.

in question. Then, in communal intercourse, history can become a source of discord or irritation more than of inspiration. Then we are doomed to being a people with neither a shared past nor pasts to share, a people on whom lessons such as that from Leo are entirely wasted.

* * *

P.S. The facts reported in Part 1 of this essay are accurate as portrayed from a recollected child's point of view. I believe that the window washer was conscripted for German military service and that Martien, a lesser victim of circumstance, went on to play the French horn with a first-rate Dutch symphony orchestra. And not to omit credit where due, my maligned Protestant uncle raised half a dozen children, providing for every one of them with a top-notch education. So there!



Above is a picture of the two houses. The "katjang" is the very narrow reddish-brown house. Leo was in the white one next to it.

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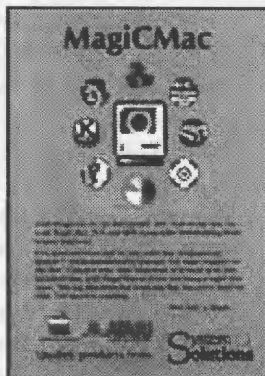
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Goodbye, and, Hello!

by Dave Small

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So, Dave Troy called up today, and while we were talking, I asked him, "What are you going to write about for the next *Current Notes*?"

And Dave said, "I've been having a hard time with this one."

"Me, too," I replied. And I think we were both hoping the other would have a good idea. We didn't. See, this may well be the last issue of *CN*.

This is weird for me, because normally when I write a column I've been thinking about it (at stop lights, on the way to get the kids to/from school, etc) for around a week, and I have it (somehow, somewhere) sorted out in my mind. I can then just pull up the Toshiba-san laptop and hammer it out, modem it to Joe, bing!, we're done.

Not so in this case.

Spinning elsewhere at a merry 3600 RPM on this computer's hard disk, heck, probably just on the next track over from this column, are other columns that I wrote and . . . well, I abandoned 'em. (I can't quite delete them yet.)

Columns about why Gadgets had to go away; the thrills and chills of taking an electronics distributor all the way in court—and, yes, losing. It happens. And so much time has passed by, so much has happened. Or write about Atari, what the ST could have been? Top 10 wins and losses for them? Write optimistically about the future? Or . . . well, WHAT? Tough assignment! See, there's *too much I could write*.

I mean, MAN! I started writing for *Current Notes* in 1987! All about how much (non)fun the Consumer Electronics Show was, in merry Las Vegas. (I was not 30 when I began. By the time you read this, I'll be 37. I've written for *CN* around 20% of my life.) And so much has happened since then, to Atarians, to Sandy and me, to *Current Notes*.

My word!, *CN* has had some *utterly classy* issues, packed full of hard-core, useful stuff, found nowhere else. Best Atari mag by far, but, I'd also be *happy* to stand up *CN* issues, head to head, against *PC* ("Yet Another Windows Review") or *MacWorld* (talk about trading off accuracy for designer look!) or even *MacUser* (very good tech but we're better, folks).

I'm very proud to have been a part of that. In some way I still don't fully understand, an eclectic (and fun!) group of people wrote all these articles and columns, and someone pulled it together into something that was "greater than the sum of its parts." Of course, that's Joe

and Joyce Waters. Theirs was the genius that put *CN* over the top.

I didn't write for money. I wrote because I wanted to. Joe never flattered or begged for articles; he was just professional about them. If I didn't have time, or had no good idea, that was okay; if I had something, that was okay, too. But I always came away wanting to do more. (In particular, I'd like to do diagrams like Dave Troy does.)

Don't get me wrong, please. I'm just a *part*, okay? *CN* was already long-going when I came aboard. Hmmm. . . . What did the Moody Blues say when people got too fixated on them . . . "I'm just a singer in a rock'n'roll band!" Well, I'm just ONE columnist in a rock and roll magazine! You want to talk to the people who *made CN happen*, talk to Joe and Joyce Waters . . . may I always have editors as tactful and kind with a blue pen as they have been.

You don't think so? Let's Take The Test: See if you remember any of these writings, from years ago, then see if you remember ANYTHING from other mags from that era. Yeah, let's see if you're a long-time "*CN-enhanced person*." (Heh! I made a Politically Correctism!). Remember. . .

. . . taming the next door neighbor's barking dog with an Atari 800 and amplifier? Or "What's with women and computers, anyway?" NF's, NT's, SP's, SJ's? (At last count, 52 people surveyed: 50 NT's, 2 NF's.) A BBS telling you how to make nitroglycerin? How everything is Numbers? Nikola Tesla? Road Trip to California, to see Cindy Claveran? (Cindy recently got married, and is now a *producer* at SEGA. Our love to her and hers. Tom Hudson is also now married and happily cranking out *3-D Studio*, a topflight PC CAD / Rendering package that is used all over the place). "No Gloom Zone?" Hotz Box? SST design? The people gone from our community by AIDS whose programs linger on?

If you've been with us since '87, that'll trigger memories (provided I wasn't so dull you forgot the columns, always a possibility). There's more, of course. '92 to now. . .

Saying thanks to so many people (many Atarians, Frank Sommers, Gregg Anderson, for example) who kept the peace, often at great sacrifice. (The folks in the SSBN's still keep it.) Sending Kristy to the U.S.S.R., and what she had to say, made for really interesting stuff. But no more U.S.S.R., and many, many changes from that. Gary Hudson, the Rocket Man, and the dream of Single Stage to Orbit (and my personal dreams so close to it). And a little un-

derground advice for surviving college? Wiring a 454 Camaro for a computer, and asking readers to help me; I got drowned in (good) advice! People took the time to design special noise-free power supplies for me, and sent drawings!

Now, does this ring any bells? I thought so. And I can tell you my top five favorite Dave Troy columns at the drop of a hat (and many other columnists). To put it bluntly, **THIS STUFF STICKS!** It withstands the test of time, and that is the test of greatness.

(Want to compare and contrast? Look at *MacWorld* slobbering over the 128K-Mac, often looking more like an Apple advertisement than a magazine; tell me *one* printer comparison in PC you care about; four dead PC-jr mags; check out them reviews of, err, non-existent, non-shipping, at-best-beta software in too many mags to name.)

Of course, some of my stuff is a bit dated. Eight years can do that to you.

Okay, update time, hold on to your hat:

Gary Hudson

Gary Hudson and Single Stage to Orbit: **HOT DARN!** (Yep, I'm gonna say it). **GARY HUDSON IS BOLDLY GOING!** Yep, *flight tests this summer, 1995*. This gives me goose pimples to write about. Gary showed up with two ready to use *rocket engines* last conference . . . he's funded extensively and is cranking out engines, vehicle design, you name it. He's waited 20 years, folks; SSTO is no longer a dream. *It's real*.

When I walked in, saw the gleaming rocket engines and Gary's big smile, and heard the news, I couldn't talk for awhile; I was too choked up. The man is a hero. When the cost of a pound to orbit drops from the current Shuttle \$10,000 by 2 or 3 orders of magnitude, and we go collect the treasures in space, Gary is one major reason why. Medal of Freedom time.

The Kids

We've always enjoyed putting our kids into our manuals, and done so at length. You might recall one of them putting a disk with mayonnaise on it into a Mac, or breaking "security" (what a riot!) into another manual. Well, time for an update.

My son Eric got his leg broken in '92. That was hard times, folks; Gadgets (and to some extent writing here) shut down while we took care of him all summer, working on his leg. Eric (13) is now within a few inches of being as tall as I am; his leg healed *perfectly*. He has Sandy's legs, which means he *will* be taller than I, and in the garage is the install-kit for his basketball hoop, awaiting better weather.

Eric wanted to use Sandy's Mac, which was password protected, so he, uh, cracked the password by guessing it. It was *not* an easy guess. (Eric is now Called First whenever the school's Mac's have trouble.)

Jennifer, chronicled in the Spectre and SST manuals, is now experiencing the (joys?) of boyfriends, and we compare notes. Since I did so terribly with girls in junior high, sometimes when she's feeling down I can leave her feeling better. . . in fact, giggling . . . telling her what I did when I was 12. (I refuse to say. It's too embarrassing. Go ahead, bring on the leeches! I won't talk.)

Jamie? We took him to the Glendale show, in a "baby jail," right inside the booth, when the Spectre 128 first went on-sale in Fall 1988 (what a line!) I remember having to change his diaper in mid-sale (the customers, well, waited; they all agreed it was necessary; never saw so much sheer *agreement* among an entire group of Atarians; it was one of **THOSE** diapers.)

(. . . And late in the show someone told me that they'd seen me doing that, and decided to buy a Spectre 128 on the spot, because they felt I was gentle in the way I dealt with Jamie right there in the middle of chaos. People telling me things like that means more to me than anything else.)

Jamie is now 7, beats me from time to time at chess, is Utterly Fearless of any computer (he beats the computer at *Battle Chess!*), and, no kidding, appears to have a photographic memory. (He watched "The Mask." A few weeks later, I said to him, "I could be a Super Hero!" in Mask-like tones. He rattled off the next five lines from the movie.) He is frighteningly bright. (Honest, he got it all from Sandy. I keep telling people, she's the one who got the CompSci degree with a high GPA. Mine was 2.001 or so.)

Sandy's still 29, of course!, and is right now reading another novel of "romance, suspense, and intrigue," (her nightly "vegging out.") If you met Sandy during our travels, you know what she looks like now; she has that Indian blood in her, never changes. She's still quick, thinks linearly (out-did our lawyer on many points), and far from "growing used to her" or some such thing, I suspect she's grown prettier every year. It's been 14 years since my greatest hack, the biggest sustained effort I have ever made, the courting and marriage of her. She's still the better programmer; I'm still the slightly mad creator and inventor, and the combination still works.

Day to day, there's still chaos (and the chaos mathematicians tell us we ought to regard that as normal); but when I get time to step back and look, I feel blessed.

Gadgets

During the Gadgets Lawsuit Era, when we were fighting for what we felt was right (this was late '91 to May '94) I didn't write as much for *CN*. Lawsuits are depressing to write about, and court, as people are finding out on the O.J. trial (may it be over soon), is like flying: a mix of utter boredom and sheer terror. It's also emotionally draining, and I often found I didn't really have anything worth much to say. Since *CN* is packed full of stuff *worth* reading, it didn't make sense to bump someone else's pages for something of mine that might at best be watered-down; unless I

have about a week to focus on a column, it doesn't work. (It really does take that long to come up with what you read in, well, not very long. My only consolation is the other writers are going through the same thing.)

Professionally, you've probably gotten a closer look at Gadgets by Small, Sandy, me, our kids, and "the outfit" than any other "real time" series/soap opera I've ever seen. I hope I showed you some of the joy, and some of the painful realities behind hardware and software development, and the personal relationships therein. That's really how it happens, folks, in the "biz." I hope I've given you some interesting stories along the way. I tried.

Gadgets by Small shipped the Spectre 128 in 1988 . . . the Spectre GCR in 1989. As many people know, Gadgets is now gone, and I could bore you with several columns (see: my hard disk) on how that happened. But I think not. That's not the point, see.

Gadgets took a parts distributor all the way, major league legal costs, for what we believed was right (we felt a chip was bad). I think that it can be rather difficult to persuade a jury of non-computer people, in a, well, primarily agricultural area, that a few nanoseconds here, a few nanoseconds there, can add up to a chip failure. . . particularly when they've not heard the word "nanosecond" before. It was *hard*; we fought the best we could, and we felt we had it won. We didn't, as it turned out; even the other side looked shocked silly that they had won.

(No, I am not putting down farmers. My dad and Sandy's dad were farmers. Sandy's dad ended up testing the SR-71, my dad ended up at MIT on a scholarship. Gimme a break.)

So Gadgets ended; the legal costs were too much. Okay.

Not Quietly

But I wouldn't want Gadgets to go any other way. You know? I wouldn't want to go like so many companies have . . . quietly, just "no ad from them this issue, hmmm. Wonder what happened."

Well, once again, Neil Young enters my life and puts words to it. (Why, Tom Harker of ICD, Charles Johnson of Codeworks, and I did a Neil Young, err, medley, at the last WAACE banquet.) I joke about Neil Young and "Live Rust," but the story of coding to his music and having the code work perfectly first time is true . . . and I found out, recently, he's working on a computer-controlled model train setup of massive proportions for his son. Cool. I'd like to meet him some day.

He said, "It's better to burn out, than to fade away . . . my, my, hey, hey."

I can't think of a better way to put it. Gadgets went supernova. And the important thing about supernovas is they generate new, heavier elements, by fusing atoms together, and throw them out into the universe. (For example, you and everything around you are literally "star stuff," literally second-generation; *your atoms were made in a star*. Our

sun is 2nd generation as well; we're a young solar system compared to the life of the universe.)

"It's better to burn out, than it is to rust . . ."

In the year since, some perspective has wandered into my mind. (It took time, and yes, there are steps in a grief process. Step 8: Write a column about it. *grin*)

Look at what we accomplished at Gadgets. That's what I'd like Gadgets to be remembered for. See, even stars end. (Our sun is going to have one of those "fade away" sorts of end, not a bang!) Worlds end. People end. *But it's how you lived that counts*.

Sure, yes, the reason I'm proud to have been with CN since 1987 is how it lived!

We started up Gadgets, and the Spectre, from essentially zero, cycled money into Spectre GCR, cycled from that into MegaTalk and SST, all products I'm proud of. (I don't think we "stuck" anyone with junk at all.) We gave the best we had, and the best manuals we could do. Many people tell us they are the best there is.

We churned out thousands of lines of code in very fast time, and it actually worked! (I won't make comparisons to Seattle area companies.) We pulled off stuff that Motorola didn't know could be done. (Possibly my best work was the zerostore handler; it made about half of Mac programs work. It's called ZEUS.S now.) 35,000 lines of code, probably 15,000 removed for obsolescence, so it's around a 50,000 line project. Major. Getting the GCR to format a disk nearly drove me up, over, around, and through the bend.

And for all this mind-bending work? (And ghastly tiring shows . . . I have never written how hard it is for me to go to a show or why; that's another "mighty boring" article. But it is rough. I came back from shows wiped out for *days*.)

Well . . . no sense keeping it a secret anymore.

Ten thousand people "turned on, tuned in, plugged in" a Spectre. One year we literally did a million dollars in sales. We shipped out big boxes of GCR's, several each DAY. It was very tiring. (Keep in mind that most of that money re-cycled into new production runs, salaries, and R&D for new projects.) But heck, the *only thing* that stopped Gadgets was legal fees that were too high, that were not in the money recycle.

So, you ask, what was it like when Gadgets was at its peak, and all this money was coming in? Essentially, when the star was shining its hottest?

Well, first, it was going out, too! We waved at it as it went by. We managed to keep a small portion of it, so we could give it to the I.R.S. (I mean it. The biggest checks we EVER wrote were to the I.R.S.) That's lesson #1 of making money.

Lesson #2 is more subtle. You learn it when you have a windfall and actually have some "fun money" to spend. Bill Gates buys cars that aren't emissions certified and can't be driven. Me, I got a Camaro and a 454 LS-6 engine (most powerful street engine Chevrolet ever made; any-

thing over it is "no mufflers, open headers, full-race competition only" running on aviation-grade octane gasoline). And I drive up entrance ramps and things. We upgraded our computers.

And then it hits you. These things are all just toys, folks. Toys for grownups. And they are not essential.

I can live without my computer running at 50 Mhz instead of 40 Mhz. (I mean, Big Deal!) I can live without the newest and latest laptop; this 16 Mhz 386SX listens for a keypress probably 2 million times a second, and that's PLENTY. I've written most of my *Current Notes* articles on it, or its predecessor.

Sooner or later, you realize that all you're doing is buying *more expensive* toys than usual. And they give you *the exact same satisfaction* as the toys you were used to. That's what it's like. Precisely. That's Lesson #2. Go shopping, then think about it in a few weeks.

It is handy to have what I would call the annoying costs of living covered. It's less stressful. But this is just a removal of a stress; it is not really a positive thing.

So after we'd learned lesson #2, and got tired of expensive toys that really weren't much different from the usual, we decided that maybe money had other uses, like helping people.

People, Not Toys

Gadgets was first a group of people, and some people associated with it . . . and it changed the directions of many lives. I am prouder of that than any of the awards we won. I know some of the stories, and will tell some, so you can see what we found out by experience.

A Change in Direction: Delta-V

Barb Hahn worked with us at first for nothing, to help us. Gadgets changed her life in that she saw us doing different things, and found she could, too. She and her husband agreed they had different paths to follow, different dreams, and are still good friends. Her husband is now doing what he always wanted, on the NASCAR circuit (!), instead of managing a repair shop he was not wild about. We gave to Barb something back by helping her with her dream, a scuba diving shop in Jamaica, a country she's loved since she was a kid. A Mac II and twin-page color monitor and LaserWriter Plus went with her. She's still using them; at last check, she was putting out a newsletter to help prevent coral-reef killoff from pollution. Way cool.

In many ways, she was the heart of Gadgets; she was the one customers mostly talked to; she made just an extraordinary effort to help people, and got on my case when I wasn't getting things fixed fast enough, or whatever. We miss her, and stay in touch.

Update: Barb is now a mom! To everyone's surprise, she has a little girl! She was always sure she didn't want to have kids, but, maybe seeing us hang in there with our kids gave her a different view, and she's very happy about how things worked out.

Kristy in the USSR

Kristy was a senior in high school and her mom knew Sandy by a painting class. She had a chance to visit the U.S.S.R., but was a little low on cash. So she did some work for Gadgets and we made sure she went. (Oh, Rest Assured: it was slave labor.) That was some time ago, but the trip really broadened her view of the world, and helped. (I did an article on her description of the trip.)

Gary

Gary Hudson showed up at HackerCon one year, and we sent him to a few more when funds were tight for him, and he couldn't have justified going otherwise, always hoping he'd link up with someone there (it's no secret some hackers are millionaires); last year, he told me, he could have paid my way in, with the funding he has now. Gary has helped me in explaining some rather technical rocket science terms, especially one called I(sp), or, "Specific Impulse," which is basically how much thrust you get per quantity of fuel (the more, the better). He's also helped in a project Sandy and I are doing (see below).

What I wouldn't give for a right-seat ride in his SSTO. It might just happen, and then my dream will come true.

Jimmy Hotz

When things got tight for Jimmy Hotz and his 21st century object oriented music system, we helped. The man's a genius. (Side note: His daughter's shown up as an extra in one of the many Star Trek TV series being produced!) And it looks like things are finally moving forward for Jimmy.

Yes

When Jon Anderson, of the band, Yes, had a Hotz box die on tour (overheat troubles under stage lights), Jimmy pointed out to him the next tour stop was Denver, and we had a Hotz box. We offered one to complete the tour with, in exchange for (our suggestion), get this: backstage passes.

If you've seen "Wayne's World," you know *exactly* how I felt wandering around backstage at Red Rocks. And Jon is a wonderful and warm human being. The Yes concert was one of the best I have ever seen, and it was wonderful to look down onstage and see *our* Hotz box working away its magic. (The music stayed in my head for a week!) The box worked just fine the rest of the tour.

The School Net

The school our kids go to acquired a network for their Macs, plus plenty of advice on what Macs to get (bang for buck). I'm going to try and teach a computer class there next . . . and just possibly start a computer club there. We can wire 'em into Internet, where the k-12 area is BIG, and it's pretty cool to find a pen pal in the next state, or around the world, to write to . . . or to GOPHER your way to the White House page. (Have to talk them into opening up a phone line, is all.)

In return, the school has been exceptional back to us, helping us when times were hard (when Eric was hurt, and during the last weeks of the court date, when time was short).

Next Generation

Lawrence and Brian (no last names for their privacy) used a Mac word processor under Spectre GCR to write a script for Star Trek: Next Generation *and sold it*. (It's the episode where the Crystal Entity gets zapped.) They were kind enough to give us pointers in the script business, because, you see, there's this show Friday nights called "The X-Files" we like so much, and an idea we like so much, we're doing a script. For real. It's spinning on this same hard disk, in fact; I'm reworking Act 2 to feed into Act 3 more smoothly. (Acts 1 and 4 are done.) It'll knock your socks off. If they accept it, you'll know it . . . it will have a Dave & Sandy Small feel to it. (Yes, another, "You can't do that! It's impossible!" Oh, but it already has been tested.)

Believe me, having someone in the business tell you its realities is the difference between an automatic reject and a real possibility of getting a script in.

"Pass It Forward"

You see how this all works?

"All the things you do, come back to you." – Aerosmith, "Dream On."

It really happens that way. I'm just listing a few examples. We helped people in various ways; it ended up passed back to us. Always.

I did a column called "Pass It Forward," where I explained that when I asked Jerry Pournelle what I could do to help him for the help he gave us, he said, "You can't. Pass it forward." He, in turn, had been taught that by Robert Heinlein, who went over the "The Mote in God's Eye" manuscript with fine-toothed-comb and gave Larry Niven and Jerry an 80-page letter on it, full of suggestions and advice. The book was a smashing success for them; they later did "Lucifer's Hammer" (#2 on the best-seller list) and more recently "Footfall." If you want a definitely fun read with a sober side to it, try "Fallen Angels" by them. (Rick Cook's "Wizard's Bane" series is a classic for computer people. Get them.) Try this philosophy. It works.

Dave & Jenn

At Gadgets, we tried to "pass forward" a lot. For example, when Toad Computers threw a get-together, I came out to be a Name they could list as "attending." I certainly didn't come out to make money; I came out to help Dave and Jenn. They're two of the most extraordinary people I know; it's sort of a weird feeling, but a nice one, when they tell me that they look up to me.

(Me? And at 37, I'm being looked up to? Wow.)

Dave and Jenn have the original Neil Young album I coded the Mac emulator to as a good luck charm for their store.

The High Point

In all I've seen, and known, in these years of the Atari ST since 1985, the one thing that stands out, by far, and means the most to me, is when Dave and Jennifer got married. I got to attend via videotape, but that didn't matter; the tape got across the look in their eyes.

While I don't think that Spectre directly led them to each other (I think they have plenty of sense, thanks), I think the ST probably played a role . . . where would Toad Computers be without the ST, and whatever it is about that machine that made us such loyalists?

Some Goodbyes I Wish I Didn't Have to Make

There's only so much time to live, and pass forward, for anything. Some friends didn't make it as far as we have.

My very good friend Willy Brown, who worked at Supra, died of rapid leukemia awhile ago, and only now can I really write about it. Willy did all sorts of things for Supra. I don't think he had an enemy in the world, and he had a wonderful wife and kids. I went to dinner with him before this happened, with Dan Moore, another old pal, and I'd like to remember him by telling the story he told me, there:

I was at some computer show, probably West Coast Faire, back in the 8-bit days, when we were doing the parallel L.E. Systems disk drive (very fast). Willy Brown came over to chat. Willy took the side that we should have run the interface through the joystick ports; we'd done it through the O.S. card slot. We argued technical points. ("Yeah, but what about the RC filters on the ports?") Anywho, time came for him to work his booth, and he gets back there, and gets chewed on by his boss. To my eternal horror, he gets told, "You don't argue with Dave Small! Even when he's wrong!" (I guess the column we did on Atari in *Creative Computing* was important, or something.)

And, of course, he was right. The joystick ports were a better way. But "Never argue with him when he's wrong?" *Chuckle*

When I heard what his boss said, I'm afraid we were all laughing so hard that I got beer up my nose! (The people at the other tables were giving us the strangest looks!)

And *that's* how I'd like to remember Willy Brown; I still use his SUPEDIT on hard disks (it has saved me easily a hundred times). Every time I run it, I remember him.

His wife is doing okay and his many friends have really helped. We sent several dozen VCR tapes of fun things (Star Wars, Indiana Jones, and so forth we'd converted to laser disks and had spare tapes) for his hospital room. We were told later it made the really tedious chemotherapy time go by better; if so, I'm glad. I loved Willy Brown; many other people felt the same way. I'll miss him, and always try to be a little bit more like him.

Frank Sommers

Frank Sommers was a columnist for *Current Notes* for some time. He wrote quite lucidly and I gained some real

insights through his columns. He's gone, now; I've found it hard to write about him, too. (There's something like a year or so before I can say much.)

Frank was my ideological opposite here at *Current Notes*. While I was working the Ghengis Khan right-wing school of thought, supporting SDI and such, Frank was of the opposite view.

I've seen some things that indicate that SDI was an ultimate hack: it helped crash the Soviet empire by diverting resources and encouraging the Soviets to compete in things they didn't have the tools for (like supercomputers and laser technology). This resource diversion was the hair on the camel's back: crashed the place. And that may have been a primary mission of SDI: remember how well publicized every SDI test was? "Another successful test." . . . probably caused ulcers in the Kremlin to watch CNN. I mean, look, a "secret" program announcing test results?!? Think about it. I'm not positive, and probably will never be, but it is an interesting idea.

And yet, for all the teasing back and forth we did (it never got real biting, like politics can, which tells you about Frank), Frank was busy doing some things I respect a great deal, but that I have to hold confidential. To lightly brush the subject, Frank was one of those people whose career was keeping the peace.

I don't live in the D.C. area and never got to know Frank very well, yet it was very nice to have someone I simultaneously respected, and held strongly opposing political views with.

Frank might be horrified to hear me say it, but I'll repeat what I said awhile ago: I was only able to do a Mac Emulator because I stood on the shoulders of giants, people who devoted their careers and lives to keeping the peace. In a way, Frank is part of the structure that produced the Mac emulator.

Thanks, Frank. You taught me a lot, and I miss you.

Goodbye and Hello?

You'll recall that the Atari 8-bit died around 1984 (although people are still running them just fine, thank you), and the Tramiels moved in, and got the ST out the door in 1985. I'd written for *Creative Computing* from 1981 to 1985 about the 8-bit. I wrote for *START*, mostly program-articles, then for *Current Notes* since 1987, in ST days.

So, you see, I've been this way once before. I said goodbye to Atari, then hello, in 1985!

I think the Atari community attracted a lot of highly talented and highly non-conformist people, who were willing to use a non-PC, non-Mac computer that worked, at the right price. It's the only way the quality of *Current Notes* can be explained, for example; the articles kept coming in, well written, and they had something to say.

So I think we'll be running into each other again. Keep your eyes open for HyperWeb, for its time has come. (FINALLY! Not that I haven't wanted to tell you its purpose

for years.) I have a little experimenting to do, then it's time to rock'n'roll. You will be hearing about it.

And David & Sandy Small should be back, as "Specific Impulse, Inc.," by the time you read this. SPI for short. (I(sp) if you're really rocket literate.) We have a few things to do before we retire, after all.

With Gary Hudson to suggest a name like that, and its connotation (how much energy per unit fuel) . . . well, we always did have a high SPI. I don't think we know how *not* to do things that way.

So goodbye, but I expect, hello soon. I think we're all headed for another turn of the circle, here ten years after the ST launched. Meantime, if I were you, I'd get USENET access (it's easy) and read the comp.sys.atari.st newsgroup. That's the fastest flying news exchange around. (I log into The Well, but there are other Internet access places. The Well just has good pricing and good people.)

It's six years until 2001. My son Eric will be 18 that year. Gary Hudson will be routinely SSTO'ing cargo up, and we just might have a space station because of him.

I promise: if I make it to orbit, I'll leave a note in comp.sys.atari.st on USENET.

See ya around,

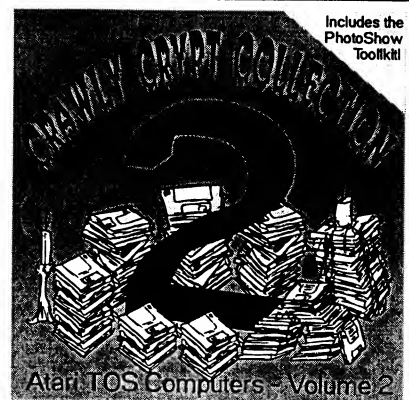
Dave Small

GENie: DAVESMALL
Net: dsmall@well.com
Compuserve: 76606,666

p.s. I loved every minute of it!

It's Here!

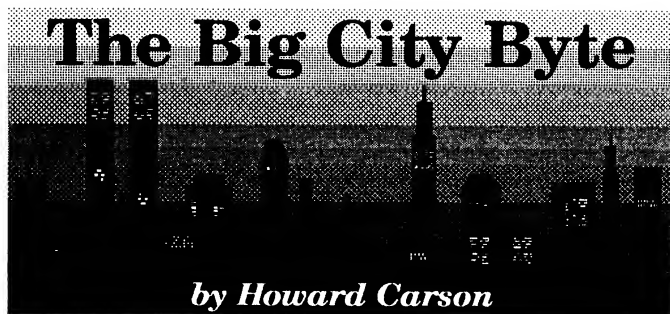
COMPACT disc



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Timelessness is a function of perception. Perception is a function of sentience. Sentience is a function of life.

If life is merely the fundamental result (reason?) for the existence of evolution, it is acceptable to assume that a legitimately cognitive existence must be successful and valid—if that existence has fulfilled needs . . . if that existence has been one of peace and understanding.

Current Notes has provided peace and understanding—thank you, Joseph. I am saddened by the loss of this great magazine and I cannot share your physical burden; such burdens are a vast and monumental curse upon good people . . . rarely those deserving of such unease.

Soren Kierkegaard wrote that, “Philosophy is perfectly right in saying that life must be understood backward . . . but then one forgets the other clause—that it must be lived forward.”

John Ruskin wrote that, “Value is the life-giving power of anything; cost, the quantity of labor required to produce it; price, the quantity of labor which its possessor will take in exchange for it.” In any essential endeavor there must be value—thank you again Joseph.

I stood upon the barren, lonely hilltop and surveyed the vista laid out before me. It was as if a correlative chain of events (apparently unrelated), had brought me to this too often repeated, yet illogical pass. As my eyes welled-up with tears from the tearing wind (it was so very cold!), I searched the distant promontory to my right for signs of movement. As the hill upon which I stood sloped down towards this promontory, I could, of course, see the ocean shore to my left—and the incredible expanse of water. It seemed to stretch endlessly (certainly it must!). And so vast was its obvious quantity that I became slightly unsettled; almost dizzy—my eyes could not properly adjust to the incredible sight. I had been waiting quite some time. I felt the beginning of a shiver.

To my right, a swirling mist obscured the shoreline at the end of the lonely promontory. The sky was a dull, even shade of gray—uninviting and depressing. I felt solitary, cold and unwanted.

But it was not long before a faint stirring on the beachhead caught my attention. I stared painfully down at the tiny figure (which appeared to be tying a small boat to the barely visible jetty—it was difficult to see from this great distance). Shivering overcame me at that moment and I had to look away, tramp my booted feet and flap my arms against my sides, in a hopeless attempt to warm myself. As I turned back to the figure on the beach, it seemed as though he (she?) was looking in my direction—and in a moment more, the figure waved. I waved back, of course, and upon doing so the figure began to move immediately in my direction.

I began moving down the long slope. Although the footing was slippery, I walked carefully enough to retain my balance. But there were ice patches obscured by a light sprinkling of snow and I finally stepped (and slipped) on one. It was not enough that I fell, too—I managed to scrape my shin in the process . . . painfully. I raised myself up though, and continued doggedly downward, resolving to finish my trek and at least meet this lone figure halfway.

I heard a faint sound (from far off still, the lone figure had seen me fall and cried out, “My god man, be careful—go slowly!” I heard the words faintly (they rolled unimpeded up the stark landscape), and slowed my pace, silently thanking the figure for allowing me (reminding me?) to do so. The scrape was giving some pain, and a slower pace was relieving though I was rapidly becoming concerned for my injury. Unbidden (and surely inappropriately?), a poem from my distant childhood came to me:

“All in the Golden Afternoon
Full leisurely we glide
For both our oars with little skill
By little arms are plied
While little hands make vain pretense
Our wanderings to guide.”

As the minutes passed and as we drew closer to each other, I kept looking around for other signs of life. It was with little hope that I did so—there was no one else living in this desolate, barren stretch of rock and beach and snow, water and ice. Life existed in reality, but few people ventured out on days such as this, and certainly no houses or winter cottages existed on this unappealing landspit. Of course, I had lived nearby for so many years that such an expecta-

tion was unreasonable . . . I certainly knew that few others lived on this hard land— I looked though, every morning, and every time a rendezvous was necessary, as it was this day.

Finally, the rhythm of my pace, and the downward flexing of my legs (buffering my descent) began to generate the warmth I so dearly craved. After a few moments more, I actually began to stop shivering, my vision cleared somewhat and I could begin to make out some details of this figure (a real person now), making his way toward me. My heart beat faster with anticipation, and I carefully picked up my pace once more (of course, being careful to avoid the hidden patches of treacherous ice!), and it was not long before the man and I stood face to face. We were both breathing heavily and smiled only weakly at each other.

"Sit, Howard," he puffed at me, "sit." He was pointing to a smooth rock. We moved to it and leaned/sat against the large thing.

We both breathed carefully, and with some small difficulty. We were not old and weak, but the damp cold had sapped our strength. We had been meeting in this manner for a long time, and so felt no need to excuse each other's frailty in the face of such hard circumstances. We spoke before long.

"Well Howard," he said quietly (the wind had abated somewhat), "what shall we exchange next time? This is the last of its kind." He held a small package in his right hand.

"I know it is the last, John," I replied firmly, "but something will rise in its stead. I am sure—something must."

"You have been right many times over the years," John said, "but I believe you may have missed the mark this time. Certainly, time will tell."

I thought of Theodore Roosevelt's strong words: "Far better it is to dare mighty things, to win glorious triumphs, even though checkered by failure, than to take rank with those poor spirits who neither enjoy much nor suffer much, because they live in the gray twilight that knows not victory nor defeat."

"Yes, time will definitely tell," I said to my old friend, "and someone will dare to fight through the apathy, the faltering excuses and their own interests, in order to resurrect some Phoenix from these ashes." I was pointing at the package he had brought. He looked down at the package and turned it over.

"So this is the last one?"

"Yes," I replied wistfully.

"I might see you once less every couple of months now . . . without this to deliver."

"I know. I know."

"I must be getting back," John said. "I have other deliveries, and this is just too sad -- for once I don't wish to stay and talk."

"I understand," I sighed. "On your way then, John. And watch out for the rocks to starboard; ebb tide now."

"Thanks, Howard," John said as he straightened up from the rock. "I'll be on my way. Goodbye. I'll see you in two weeks . . . take care of yourself."

"Goodbye John." I turned away.

I stood in that spot for a few minutes, then turned once more toward the ocean, the craggy shore and the dull expanse. John was making his way carefully toward his small boat. The tide had ebbed somewhat and I could just make out the shape of his motorboat, listing distinctly to port (its small keel rested mostly on the beach now, and leaned against the low jetty). I no longer felt the cold, and stood stock still watching John's progress. Eventually he reached the boat of course and launched the craft by main force (it was only a fourteen foot motorboat). I heard a very faint hum as he started the motor and chugged his way back across the bay.

I was alone again, my nearest neighbors a mile or more away. In other circumstances, John would have stood while I ripped open the package—we would have sat together and read the contents, poking fun at the mistakes, learning quickly from the experiences written about by others, and remorselessly criticizing my own literary contributions.

"I ain't a Kat . . . and I ain't Krazy . . . it's what's behind me that I am . . . it's the idea behind me, Ignatz, and that's wot I am. In my Kosmis there will be no feeva of discord . . . all my immotions will function in homminy and kind feelins." Krazy Kat (George Herriman).

I tore open the package. It contained the last issue of *Current Notes*. So sad.

Thank you Joseph. Goodbye.

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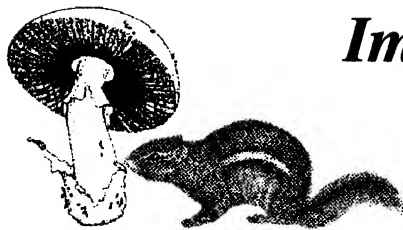


Image Processing with Calamus SL & The Addendum to Star Screening

Running Out of Ram by David Barkin

It's now been six months since I joined the modern world by signing up with GENie. Lord knows I still suffer trepidations about "surfing" the Internet. Being on GENie has been enough of a shock to my ego as it is. Before this experience, I could sit back and smugly consider myself the *Calamus* master. Let them crawl, and maybe, just maybe, I would share my vast store of accumulated knowledge. Well, such has not been the case. Many of the hoodlums and other assorted riffraff and trash who inhabit the DMC support section appear to know more than I. This is intolerable. People who go by the fanciful names as "Orca," "The Inkman" and quite a few others too numerous to mention have calmly, and, I might add, deliberately, taken the time to make a fool out of this underserving author.

By the time you read this article, these people will no longer be with us. Yes, sad to say, there are probably going to be many unfortunate accidents occurring to many of the devoted DMC supporters. It's safe to say that, in the future, only "Guppy" and "Marshmallow" will be left on topic 16. Since both of them tend to ask such advanced questions such as; "What is a frame?" or "What does the little coffee cup sign mean?" I expect once again to be able to assume a more masterful role in the ongoing discussions. This little announcement off my chest, we can precede to this month's diatribe, pardon, article, dispensing more *Calamus* wisdom.

Image Processing with *Calamus*?

An odd question. This is a DTP program—You know, typesetting, combining graphics with type, etc.. Yet, by gosh, there are enough *Calamus SL* modules out there to make some image processing techniques possible. There is the new *Filter Module*. Just released, this module contains some powerful filters including, Sharpening/Blurring, Embossing, Effect and a user configurable filter that, by itself, can produce powerful effects. The *Mask Module* can be used to create special effects all on its own, or can even be used as a cutting tool, to produce collages out of different images. The *Bridge module* can be used to combine vector and raster graphics into different formats, which can then be edited in the various tools. Aside from all the described modules, there are the built-in graduation tools within *SL*,

to adjust contrast and brightness. This is all very promising. *Calamus SL* is *not* an image processing program, but strange as it may be, it's getting there. How would some of these effects work in practice? Let's take a look.

The Filters Module

At the moment, there are only four filters available, although more are promised shortly. But these four include a user adjustable filter that, by itself, is a whole flock. It's very simple to activate this module. Load the module, load in the desired filters and then select an image to be processed. Activate the desired filter, set the parameters and, fairly rapidly, you have your results. This description leaves out one big plus of the *Filters Module*, which is to say, the preview mode. Fast

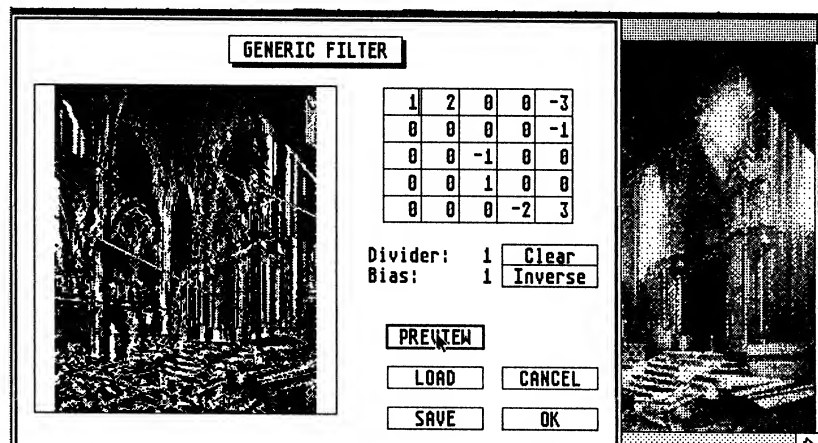


Figure 1. The Generic filter, with some custom settings showing the preview mode.

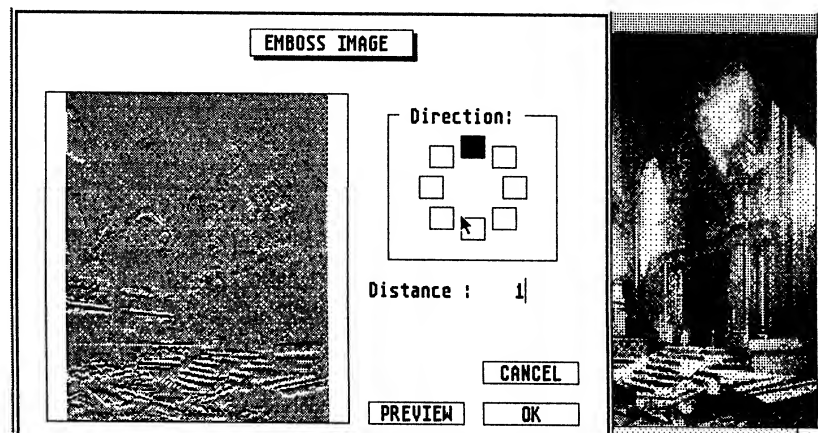


Figure 2. The Emboss filter, with some custom settings showing the preview mode.

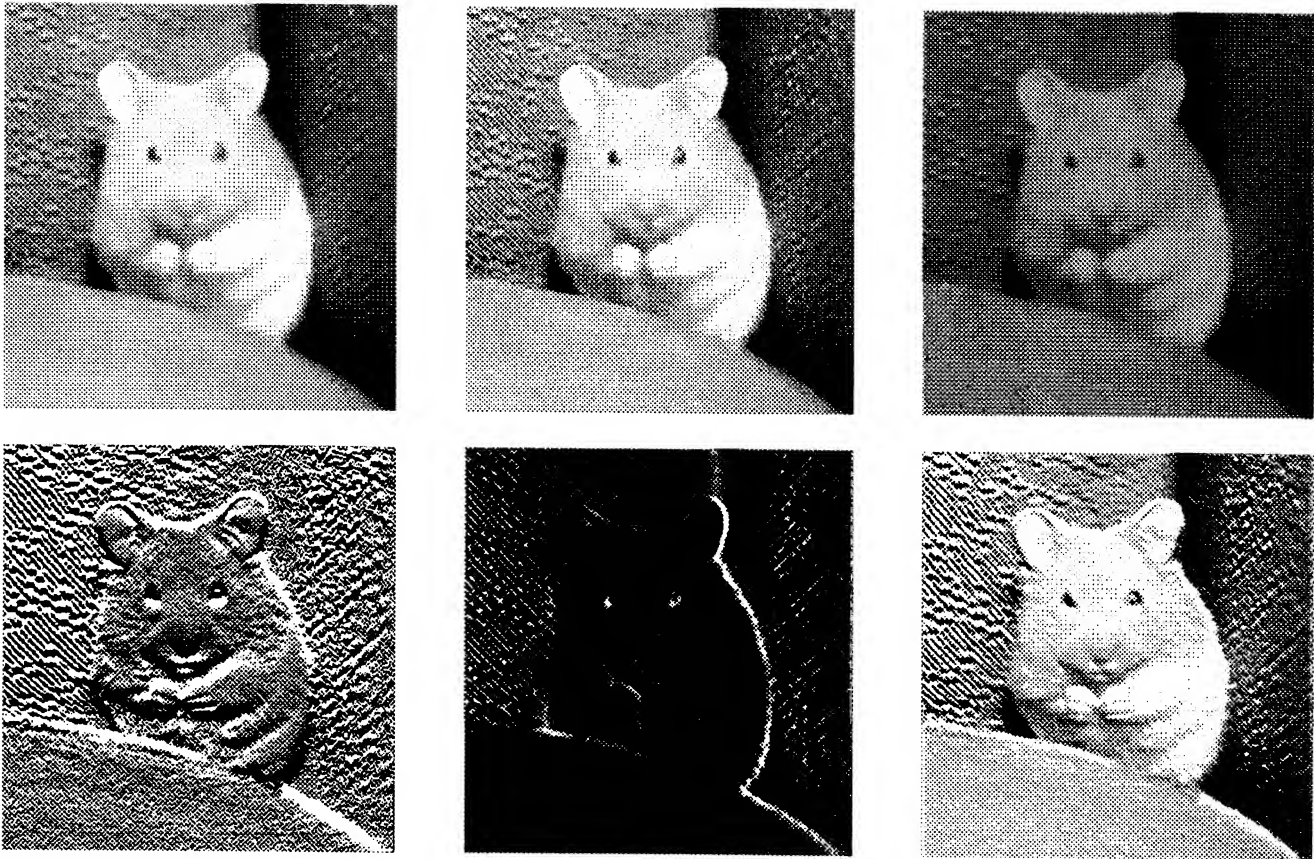


Figure 3. Here are a handful of the possible effects. From left to right, top to bottom: The original picture of my new dog, the sharpen filter, the effect filter, the emboss filter and the last two images are both from the generic user definable filter.

as this module is, in processing information, a large TIF file will take time to work. The *Filter Module* contains a preview mode that shows you exactly the results of your selected settings. This is a big bonus and I was very surprised to find it here in a module. *Das Repro* and *Das Picture*, the most powerful Atari image processing programs, both lack this preview mode and quite a bit of time is lost by its absence. I really should emphasize the importance of this more—Ok, it's great!—I definitely appreciate it.

Figure 3 shows some of the effects possible with this module. These examples by no means cover the possibilities. Each module has parameters that can be set to profoundly alter the effects.

The Mask Module

This is an extremely powerful tool, which is both incredibly simple to use and amazingly complex in the possible outcomes it achieves. It deserves a review all on its own. Unfortunately, space is limited, and I'm going to touch only on its abilities for processing images. Briefly, select two frames, execute the mask function, and the bottom frame becomes a cutting tool. The resulting image can, in turn, be inverted or used with another frame to create a new and more complex frame.

The first and obvious use for this module is creating filled text. Any vector or raster frame can be used to create a

fill for text. In terms of image processing, the possibilities are endless. If you are just using mask to crop an image, the underlying frame, which will be used as the cutting tool, should be black. This will result in a clean result. But there are other possibilities. If the underlying frame is 50% gray, the result will be a 50% reduction in the depth of color in the result.

Creating a Collage

In figure 4, I'm using the Vector module, now standard with *SL*, to cut and create an outline of my dog. After creating this vector frame, I can use it to cleanly cut my dog out of the frame. If I had made a copy of the vector frame, turned that copy from black to an opaque white, grouped the mask frame with the white vector frame, I can now superimpose the result on a new raster image and thus create a collage. Crude, but fast and efficient. All this within a DTP program, with no sacrifice in the speed or efficiency of the program. Once again, I'm reduced to my petty cliché of "mind boggling!" This entire cutting process, which in regular image processing programs is referred to as masking, is easily accomplished even in *ST* high resolution. Simply use the built-in contrast tools of *Calamus* to change the contrast of the image so that it's easy to see how closely your vector lines conform to what you are cutting out. After finishing, simply restore the original contrast. Figure 5 shows an example of the result of a simple collage.

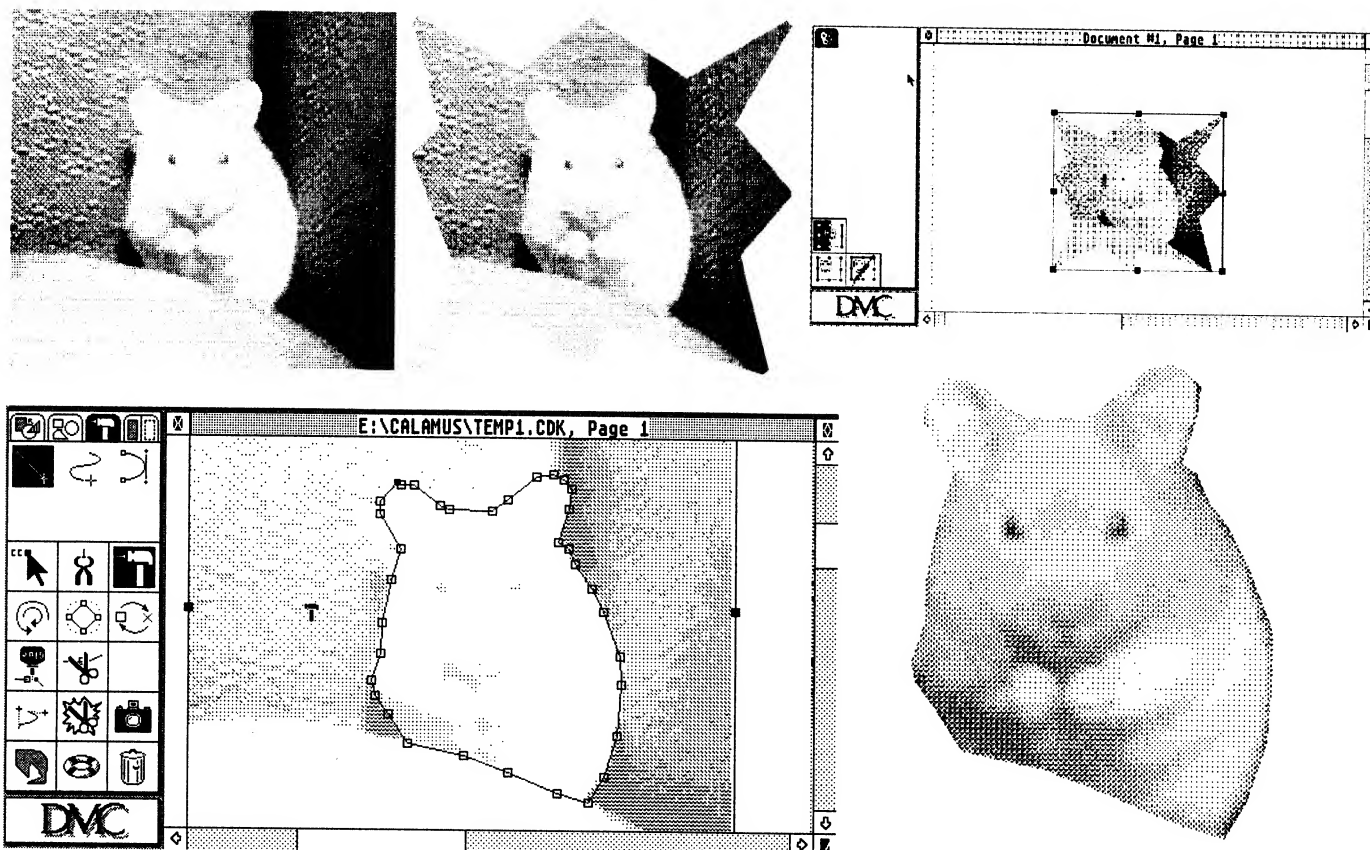


Figure 4. Here are some of the possibilities of using the Mask Module. In the first example (top row) Mask is used simply to crop an image in an irregular manner to provide a little emphasis for my new dog. In the second series, I'm using the Vector Module to cut my dog directly out of the background to paste onto another frame. See figure 5, below, for the result.



Figure 5. Here's my final collage showing my neighbor's pit bull, Lucky, and my two present dogs, Genata and Hammy. One lack of image processing with Calamus is that there is no retouching tool to smooth out inconsistencies in combined images

Combining Modules

Instead of the *Vector Module*, the new and powerful *Line Art Module* can execute even more complex vector designs, which in turn can be used by *Mask*. Finally, the *Bridge Module* can be used to convert your results, or the intermediate stages of your results, into different types of frames which can in turn be combined with your work. The *Brush Module*, the optional raster drawing program, while essentially limited in its power, can also be used in conjunction with *Mask* to further alter images.

Space limits this month's article. Indeed, I haven't even touched on all the possibilities, but the potential is there, because, in some ways, this combination of features has more power than other image processing programs. Don't get me wrong, I haven't thrown away my copy of *Das Repro*, but I certainly don't miss any of my other image processing programs.

Other News

DMC has released another new module. This is *Stereo Magic*. This module converts normal graphic files into those 3D images so popular in bookstores. Yes, I've spent many hours staring at these pictures

until my eyes turned into bloodshot stones of pain, all without seeing anything. Apparently, *Calamus SL* users will now have the same privilege, and right in their own homes. Children and brain dead adults have told me that they "see" these pictures. I even waylaid an innocent child on his way home from school and made him look at a sample result from this module. He joyfully told me what was in the image. Of course, the kid is lying, but you never know.

For further information on the above modules and pricing (*DMC* is now selling the *SL* program for \$200) call or write to *DMC* directly. (*DMC* Publishing, 2800 John Street, Unit #10, Markham Ontario, Canada L3R 0E2. Tel: (905) 479-1880; Fax: (905) 479-1882; GENie: DMCPUBLISH; Compuserve: 76004,2246.)

Addendum to Star Screening

Well, it's the day after Christmas, in other words, one month after I first wrote about the *Star Screening Module*. What have I learned? To make sure that you read the full addendum, I'm going to start off by saying that I've discovered how to overcome the memory limitations of this program and that anyone can use this Stochastic Screening method to create an image as large as he wants.

Just How Important Is Star Screening?

Before I go any further, I don't want anyone to get the impression that this technology brings about miracles. There is a vast qualitative leap in performance when one conventionally screens multi-valued gray/color images, than the older fixed image formats. Even with the home printer, this improvement is dramatically visible. The leap from screened images to Stochastically screened images is, in no way, so dramatic.

Two Exceptions to the Above

There are two exceptions to this. The first is that very small images, such as postage stamps or identification photos, are dramatically improved. The tremendous increase in printed dots is the reason for this. I am also assuming a high degree of quality in the scanned image. No method of screening is going to enhance details which are simply *not* in the image. In conventionally screened images, the individual cells lack the clarity of the Star Screening method. As the image is expanded, the edge in quality of Stochastic Screening diminishes. The conventionally screened method can now bring out greater detail. A tiny figure in a photo, which was initially a minute speck, which at 300 or 600 dpi, simply couldn't be printed, is now large enough for a conventionally screened printout to show detail. Even so, the Stochastic Screened version of the same image will be better, if not always dramatically better. The second exception to the rule is that images lugged down to a service bureau will be dramatically improved over the same image conventionally screened.

All in all, the Star Screening Module provides a big edge to *Calamus* users over any other desktop publishing program on this, or any other platform.

Control Lines

One simple work-around I've been using is to load my images into an image processing program and copy the image in such a manner that the color levels are reduced by a certain percentage. If the image was initially very dark, I might make this copy at 75% of the color values. If the image was light, I might make this copy at 90% of its color values. When I then Star Screen the image, I use a neutral, which is to say no, control line. This is for my home printer, the Hewlett Packard HP IV. Each printer will require a different technique. In fact, images prepared for output to a service bureau will require different methods entirely.

Overcoming Memory Limitations

Readers of this article have no doubt noted, that to use this module you are limited by memory to roughly 360,000 bytes of memory for each square inch of image. This assumes a screening of 600 dpi. Images screened at 300 dpi will need 90,000 bytes of memory per square inch. Thus, with 4 megs of free memory, at 600 dpi, you are limited to roughly 11 square inches of image; a 3 by 4 photo. **BUT**, what if you take your initial photo and divide it into quarters? Load these fractions into *Calamus* and expand each fraction into the maximum size your memory allows for screening? After these fractions are screened, they can be aligned and grouped and, presto, you've quadrupled the maximum size that can be screened. Instead of being limited to 11 square inches, you've just made an image 44 square inches in size.

If you wish to take this file to a service bureau, they can be grouped and, using *The Bridge Module*, exported as a monochrome .TIF file and printed, as any other image is printed. *Das Picture*, *Das Repro* (formerly *Retouche*) or the *Mask Module* of *Calamus* can do the exact cropping this technique requires. *Calamus SL* allows the user to "magnetize" his frames. This assures both a perfect and an easy alignment.

Summing Up My Addendum

Other factors I've learned since my initial article is that if an image is large enough and, in turn, contains large areas of *similar, but slightly different color values, the default minimum and maximum drop off values may cause banding in the final output*. If this is a problem with your results, raise the default numbers, which are initially 0 and 36 until the banding disappears. These options control the module's decision as to whether a pixel is white or black. Raising these values seems to make more even transitions between very similar color values when there is a large area being screened. The higher the number, the more likely that the resulting printer point will be white as opposed to black. In turn, to maintain proper contrast, the control line used for this screening should create a darker frame. *Experiment!* This is, by no means, a final report on the capabilities or use of this module. But it's been a lot of fun working with it.

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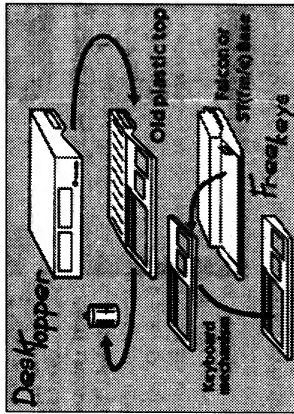
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No, it doesn't come on a CD (yet!) - it lets you read and write Photo CD files! More formats, more files, more printers, more EVERYTHING! This is the long awaited followup to ImageCopy 2, previously imported by Codehead. Now ImageCopy 3.5CD is available exclusively from Toad Computers!

PAK 68030 Board.....\$299

This 68030 upgrade board works best with Mega ST computers but can also be made to work in ST and STE computers installed in a Desktopper case. Provides 32MHz 68030 and 68882. TT FastRAM support is coming soon, but in the meantime its second level cache makes the 68030 move faster than a TT030! TOS 3.06 (Modified, Required).....\$99
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Toad's CD ROM Tech-Talk with Dave Troy

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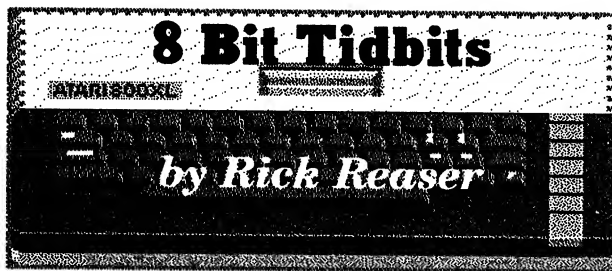
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Last Call

It's been a little over three years since I wrote my first "Tidbit" in the March 1992 *Current Notes*. Five moves, 28 columns and 96 article edits later, here I am, helping to close out the end of an era. The last big American Atari magazine is about to finish its 15-year run.

Eleven of those years were under the extraordinary leadership of Joe Waters, our publisher. It was Joe who transformed the meager club newsletter into the 84-page, color cover, masterpiece you're holding now. Joe, through *Current Notes*, helped define the Atari Culture.

I've had the good fortune to know Joe since the beginning, back when NOVATARI used to meet at the Greenbrier Community Center. Working for him on *Current Notes* has been a real joy and pleasure. So Joe, thanks for the leadership, the patience when I was running behind, letting me store my car at your house and everything else.

What of the 8-bit Atarians?

Well, they're still out there—scattered all over the place. It seems like every day I find a new pocket of them. My advice? Get a modem and get connected. Communication is the key to survival. Fidonet, Usenet, GEnie and CompuServe are all great places to stay in touch with what is happening and what is new.

Though shrinking in number, there are still a lot of Atari vendors and developers. There are still a number of good club newsletters available. For instance, I just got the Phoenix Club's "Nybbles and Bytes" and it was excellent. Atari Classics is out there lurking somewhere as well.

We'll survive. My fourth grade son just typed his first major report with *TextPRO*. That makes him an accomplished third generation 8-bitter, after his dad and grandpa (who still has four 800s under his bed). I just discovered my boss' first computer was Atari 800 and he still talks about it. At the last staff meeting, he actually said it was a better computer than the NeXTs we have on our desks. But enough nostalgia. If everything goes as planned, this should be a jam-packed issue for 8-bitters.

Elsewhere in This Issue

Veteran writer, Tom Andrews, provides a clever tutorial on *Fast Fingers*. *QWK8* author, Robert Stout, provides a short review of his popular program. We have a review of *IceT* by Kent Johnson. Then veteran writer, Dave Paterson, reviews *FlickerTerm*. Joe Walsh is back by popular demand with an insightful article on "artful programming" with your 8-bit. And, finally, Joseph Hicswa re-reviews *SwiftCalc*. Joe is President of the Jersey Atari Computer Group (JACG). Since there is so much stuff this time, I will keep it short and cut to the news.

8-bits Forever

Gordon Hooper sent me a complimentary copy of his booklet, "8-bits Forever." It is a collection of 17 humorous essays by Gordon. *CN* has actually published several of them in the past. It has lots of cute stuff. The 64-page publication costs \$6.99 US or \$7.99 Canadian from: Gordon Hooper, 253 Regina Ave, Victoria, BC V8Z 1J6 Canada.

ARTACYIS Software

I received an interesting disk catalog of over 60 original games programmed by James Catalano. James was willing to make some of his 8-bit games available as type-in listings for *Current Notes*. He sells each game for \$10.00. The disk catalog is available for \$2.00 from: ARTACYIS Software, 639 West Grace, #336, Chicago, IL 60613; phone: (312) 248-6065.

TextPro 5.2 Manual

Charles Cole told me (via FidoNet) that Dale Wood put out a *TextPro V5.20X* manual of 106 pages, fully indexed, with a color front cover, spiral bound, with clear plastic outer protective covers on both front and back. I ordered one. It's neat.

Dale also has versions for all previous releases of *TextPro*. The prices are: TP5.20X documentation: \$12.00, shipped Priority Mail. Add \$4 for a two-disk set (double-sided disks) containing the program, add-in modules, some macros, and the full documentation. Add another \$4 if you want two more disks of support files.

The manual is very professionally done, printed on a 24-pin printer. For further information, please contact: Dale Wooster, 7113 W. Pasadena, Glendale, AZ 85303; (602) 846-1575.

Hidden SpartaDOS Feature

Andy Floyd posted an interesting discovery on the FidoNet regarding SpartaDOS X 4.20 that I thought I'd share with you. Andy discovered the following. Inverse Video characters invoke a SpartaDOS command. Here is a table of what he found out.

Inverse	Command	Inverse	Command
A	ATR	M	MKDIR
B	BOOT	P	PAUSE
C	CREDIR	R	RMDIR
D	DELETE	S	SAVE
E	ERASE	T	TYPE
F	FORMAT	V	VER
L	LOAD		

Try it! He didn't test this on 3.2d or 4.21. It works as if you actually typed the whole thing out. <Inverse A> +P B:*. * and it'll protect the stuff on Drive 2! Format a disk on SDX with only an Inverse F! No typing "FORMAT" ... again!

GENie Files

There are a couple of new files on GENie that you ought to know about. File #7286 contains the Unofficial Atari 8-bit New User, Emulator Help FAQ 0.7 by Bill Kendrick. Differences from Rev.0.5 included corrected descriptions of Atari computers and corrected *PC Xformer 3.0* dealer list as well a listing where *Mule* and *Util* can be found. Differences from Rev.0.6 included updated Branch Always Software information. This FAQ is extremely helpful if you use *PC Xformer*.

The index for the Atari Archives at the University of Michigan is in File #7244.

Couple of New Atari Vendors

My local SysOp told me about this place that sells and repairs 8-bit and ST hardware. They have a large selection of software. The owner is very knowledgeable and helpful. The prices are reasonable, as well. Here's the address: ATCOM Micro Center, 1421 Thousand Oaks Blvd, Thousand Oaks, CA 91362. Phone: (805) 497-1220.

I picked up this info from csa8. Computer Games Plus has been an Atari dealer since the early 8-bit days. They have a selection of 8-bit titles. He will send a list if requested. There are still some really nice titles left, and they are all NEW. The owner's name is Art Turco. Be sure to mention Atari 8-bit. You can reach Art email at aturco@netcom.com or phone (714) 639-8189.

And What of Me?

I'm going to enjoy the break from gathering news, soliciting articles, editing and writing. It's a lot of work! I do plan to spend more time with my children and, hopefully, coach my son's soccer team. I have no plans at present to buy another computer, so I'll be around on the networks and hope to write an article or two if another Atari magazine emerges.

That's all. Please keep in touch email or snailmail at one of the addresses in the masthead.

KEYBOARD GIZMO from **chro-MAGIC**

The Keyboard Gizmo allows you to connect IBM keyboards & mice to any Atari that was originally in a "1040 style" case (includes most 520/1040 ST/STe & Falcons). Unlike other lower quality products, the Keyboard Gizmo does NOT need any software drivers nor does it require you to "steal" parts/chips from your Atari keyboard. It completely emulates all the functions of Atari's keyboard. The computer won't be able to tell the difference, but you will! Only \$79 (US) retail.

Falcon RAM GIZMO from **chro-MAGIC**

The RAM Gizmo allows you to use standard 8 or 9 bit SIMMs with your Falcon030. The RAM Gizmo supports 1, 4, and 14 megabyte memory configurations using 256K, 1 Meg, and 4 Meg SIMMs. The RAM Gizmo will work with *ALL* 8/9 bit SIMMs that are at least 80 ns or faster. You won't get any memory glitches or "screen garbage" when you use the RAM Gizmo! Don't settle for less - insist on the best - the *ORIGINAL* RAM Gizmo! Only \$99 (US) suggested retail.

Falcon MultiSync GIZMO from **chro-MAGIC**

The MultiSync Gizmo is a multisync monitor adapter that has a switch to toggle between VGA and RGB modes. Just plug in your multisync monitor and set the switch - that's all there is to it. You can even switch between VGA and RGB "on the fly" without having to reboot the computer. The MultiSync Gizmo is backed by a full 1 year warranty and is available now from finer Atari dealers everywhere. The suggested retail price is only \$24.99 (US).

With a guy like "Gizmo", what could possibly come next?

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A Fast-Fingered Solution

Tips for Using Chris Chamberlain's Fast Fingers

by Thomas J. Andrews

GEnie: T.ANDREWS16

Hi! You're the new member, aren't you? Welcome to the club.

Thanks. What are you using there? It really looks interesting.

This? Oh, this is a Fast Fingers file at work.

Fast Fingers?

That's right. You'll be hearing a lot about it around here, especially if you talk much with Alex Pignato. Anyone who's been a member of the Ol' Hackers Atari User Group for very long knows of our president's penchant for *Fast Fingers*. Alex has spread the gospel of this useful program far and wide, and we've all reaped the benefits.

What is it?

Fast Fingers was written by Chris Chamberlain and was published in the May 1984 Antic Magazine. Yes, that's right, way back then. It's a BASIC program that creates an AUTORUN.SYS file which takes over the keyboard and does your typing while you sit back and watch. It can load and run programs, respond to prompts, and shut itself off, all while you stand aside looking superfluous. It's great for program demonstrations and for situations where there's a complicated bootup procedure like, well, like this one.

Is it hard to use?

Running it is easy. Just RUN "D:FINGERS.BAS" with either Atari or Turbo BASIC. At the prompt, type in all the keypresses you'd need to do what you want to do, just as you'd type them if you were going to do it yourself. 200 keypresses is the practical limit. When finished, press [CONTROL][3]. You then have to tell whether you're using disk or cassette. Remember, this program was written back when there were still lots of cassette users.

Not too bad so far.

Next you have to assign a load address. This is the temporary address where the AUTORUN.SYS file is loaded before it's executed. In most cases, the address suggested by the program is fine. If you're going to do something like load in the R: handler, you'll want to move it somewhere higher.

The program in the AUTORUN.SYS file places a patch program that does all the real work into an address you specify, then is no longer used. The patch, however, and the keypress buffer that follows it, need to be in a place where they won't be overwritten by the program you'll be using. *Fast Fingers* suggests Page 6. That will work fine so long as your

program doesn't use it. If it does, you'll have to find another place for it. Unfortunately, I can't tell you where that is, because it depends on your application. If you're not using a cassette, and you don't have over 70 keypresses, the cassette buffer, location #1021, might be a good choice. You'd have to try it and see what happens.

What else?

After that, all you have to do is specify the speed of the Fast-Fingered typist and if you want the Fast Fingers AUTORUN.SYS file appended to an existing file. Once the AUTORUN file is created, just shut off your computer, put the newly created disk in drive 1, and boot up. If you did everything correctly, *Fast Fingers* will do all your typing for you.

Sounds good. Any problems I should look for?

Sometimes the *Fast Fingers* file doesn't seem to work right. You'll get a situation where it seems that one of the keypresses was dropped or ignored, and that messes up everything that follows it. There's a simple fix for that problem, but to understand it you need to understand the reason for it. To do that, you need to understand how *Fast Fingers* works.

How DOES it work?

Every 60th of a second, during the Vertical Blank Interrupt, the OS checks the keyboard to see if a key is being pressed. If it is, that keycode is moved into memory location 764 (commonly named CH), where it waits for the keyboard handler to process it. Oh, there are debounce circuits and repeat delay timers, but, essentially, that is what happens. The handler doesn't process the keypress until a request is made by the main program.

Fast Fingers redirects the OS interrupt processing routine away from the keyboard and feeds location 764 from its own keypress buffer, until that buffer is empty. It's that simple.

So why doesn't it always work?

Once the keyboard handler processes the contents of CH, CH is cleared by poking a 255 into it. When *Fast Fingers* sees this 255, it puts the next keycode into CH. But the keyboard handler isn't the only place that 255 can come from. Many programs, particularly those that use single-key commands, will clear 764 before asking for input, to avoid extraneous inputs that could cause disaster.

If *Fast Fingers* had the appropriate keycode waiting in CH when the program cleared it, it would be ignored. The next keycode in the buffer, probably completely inappropriate,

would be the one fed to the program, and everything would fall apart.

So how do you get around it?

Easy. First, you have to determine the precise point where the keycode is ignored. Then, create a new *Fast Fingers* AUTORUN.SYS file. This time, though, put an extra keypress in at the trouble spot. It can be almost anything. I like to use RETURN because, if I'm wrong, it's usually pretty safe.

This is done to give the main program something to clear out of CH so that the right keycode will get there at the right time.

Is that all?

You may have to do this more than once for a single AUTORUN.SYS file. Once you've compensated for the problem at one point, it can easily show up again at a later point, whenever CH is cleared before keyboard input is requested.

I had that problem when I was setting this disk up. Have a look.

Looks like a text adventure. I like them. They let you think, not just jiggle a joystick.

It's a text adventure, all right. *Escape From Dispozon* was originally a two-part disk bonus game from Antic Magazine in 1988. The player takes the part of Havilfad, who has crash-landed on the Galactic Trash Planet, Dispozon, with a droid named Iggy. The goal, of course, is to find a way to escape. Havilfad gives commands to Iggy to move from place to place and manipulate objects. He gets all his information from Iggy's responses, which are highly variable, even within the same situation. Iggy also has an attitude, periodically requiring a "please," "thank you," or "sorry" before he will proceed.

I've heard of it, but never played it.

It's a good game to play, but suffers from a small, annoying problem. The original Antic EFD is contained on two DOS 2.0 disks. There is a story disk, which contains the setup text, initialization data, the main program, and the preliminary position file. The other is a program disk, which contains nearly 60 short files filled with Iggy's potential responses and descriptions. You boot up from the story disk, then put in the program disk to play. The problem is the almost constant disk access during play. It slowed things down, and was wearing out my drive, to boot. The solution, of course, was to move the program disk into the RAMdisk in my 320k 130XE.

I hate it when you have all that disk access, too. Did you have much trouble modifying it?

Changing the main program wasn't difficult, requiring only a few drive number changes here and there. The difficult part came when I wanted to set up a single disk that would automatically transfer the response files to the RAMdisk, then load and start the main program.

The problem was with combining the two disks into one. By the time you add DOS files, story files, initialization files, the main program, and response files together, you have far more than the DOS 2.0 or 2.5 limit of 64 filenames per disk. Even if I could use more than 64 files, they needed more space than was available on an enhanced density disk.

Wouldn't another DOS work?

I thought about switching to MYDOS 4.5 for a while. MYDOS would let me use double density on my XF551 and US Doubler-equipped 1050, which would solve the storage space problem.

While MYDOS has the same 64 filename-per-directory limit as DOS 2.5, it supports subdirectories. A subdirectory is listed in the main directory much like a regular file. It can contain the directory information of up to 64 more files not listed in the main directory. These files can only be accessed through the subdirectory like this: Dn:SUBDIR:FILENAME. This arrangement solves the problem of too many filenames.

There is also a program packed with MYDOS called RAMBOOT3.AUT. This program will initialize the RAMdisk and transfer any files in the D:RAMDISK: subdirectory to the RAMdisk. That solves the problem of loading the RAMdisk. By the way, the MYDOS RAMdisk can be configured to use all the extra memory in your computer. This means a 320K XE can have a RAMdisk with over 2000 single-density sectors, plenty big enough for Iggy's response files.

2000 sectors! What would anybody do with a RAMdisk that big?

I use it all the time when I'm using my modem. It's much faster when you're downloading files to send them to your RAMdisk while online, then transfer them to a floppy after you log off.

I have a modem, but I don't use it.

That's pretty common. The idea of using your computer on the phone lines to talk to another computer can be pretty intimidating. It was for me, at first. We can help you get started, if you like.

I'll think about it. Why didn't you use MYDOS? It sounds like just what you needed.

I tried it. I put the response files into the RAMDISK subdirectory, and the program, initialization, and story files into the main directory. To speed up play even more, I put the Turbo BASIC XL interpreter on the disk and put a .ARB extender on the main program so it would load and run automatically when Turbo BASIC was activated.

The MYDOS arrangement worked, but I still was not happy. While the program worked great, the RAMBOOT3 file transfer was slow, taking nearly four minutes to load the RAMdisk. The whole boot procedure took over five minutes. I was sure there was a better way.

What did you finally do?

There were two things I wanted to accomplish. First, I wanted to speed things up. Second, I wanted to use enhanced density, so I could still use the game if breakdowns forced me back to using a stock 1050.

I formatted a disk using DOS 2.5 and wrote the DOS files to the disk. Then I added Tim Patrick's SmartRAM 2.5 (September 1989 Antic), a version of RAMDISK.COM which will create a RAMdisk in a 256k or better XL/XE that is the same size as an enhanced density disk, and is completely compatible with Turbo BASIC. Next, I put the story, initialization, and position data files on the disk, along with the Turbo BASIC interpreter.

Now comes the tricky part. I used Bob Puff's Super ARC program (ARC.COM) to compress and combine all of the response files and the main program into a single file on the disk, reducing the requisite storage space for them from 882 sectors to 552.

Super ARC?

If you start using that modem you'll become very familiar with the ARC concept. It's frequently used on BBS's and the pay online services, primarily to reduce download time, but also to group related files together. The amazing thing about it is that you can ARC a file on one type of computer, say an IBM, and restore it on another, like an 8-bit. Of course, UNARCD files are restored to their original condition, so you still won't be able to run an UNARCD IBM program file on your 8-bit, and UNARCD text from other computers will probably be in ASCII instead of ATASCII. But then, ASCII is easily translated, and who wants to run IBM files, anyway? Bob Puff's ARC/UNARC package is shareware, and is available almost anywhere, including our club library.

I'll look into it.

ARCD files must be restored before they can be used, so I put a copy of UNARC.COM on the EFD disk.

And all that now fits on a DOS 2.5 disk, huh?

Yep, with room to spare. Now I was ready to prepare a *Fast Fingers* file to automate my boot procedure, which would be rather complicated. I booted manually, keeping track of every keypress I used to get the game up and running.

I held OPTION as I switched on, and RAMDISK.COM initialized the RAMdisk. Using DOS option L, I loaded and ran UNARC.COM. I used UNARC to read the ARCD file from drive 1 and decompress it to the RAMdisk. When it was finished, I returned to DOS and used option L to load the Turbo BASIC interpreter. Finally, I instructed Turbo BASIC to RUN the main program from the RAMdisk, which initialized from drive 1, and I was ready to go.

That IS rather complicated. What happened?

I created a *Fast Fingers* file with all those keypresses, tried it out and ran right into trouble in UNARC. When UNARC is finished with a file, you are instructed to press RETURN to go to the main menu, from which you can return to DOS. When *Fast Fingers* tried this, the one-letter DOS

command was ignored, plunging everything into confusion. Obviously (At least it's obvious now. It wasn't at first.), CH had been cleared at that point.

I redid the *Fast Fingers* file with an extra RETURN inserted just before the UNARC command to go to DOS. I tried it again, only to find the same problem at a different spot. This time the L command to load Turbo BASIC was ignored. I might have suspected DOS cleared CH this time, but past experience told me otherwise. I think that UNARC must have cleared it just before calling DOS.

I redid the *Fast Fingers* file again, tried it, and everything worked perfectly. The time from switch to play was reduced to around two minutes and 40 seconds. I can live with that.

Why the big speed increase?

Three reasons, actually. First, the ARCD file had close to 37% fewer sectors to read, and disk I/O is frequently slower than processing.

Second, according to what others have told me, the RAMBOOT3.AUT I/O buffer size is only one sector long. This means that it must read a sector, then save a sector, then read the next sector. It's much faster to read several sectors at once into a buffer, then save them. If you want to see what I mean, try copying a file from DOS 2.5 without using the program area (MEM.SAV left intact), then try it with using the program area. The only difference is the size of the buffer.

I'll take your word for it.

Third, in order to transfer files to the RAMdisk, RAMBOOT3 must look up the first file in the subdirectory to find out where it is on the disk, copy that file, then go back to the subdirectory for the information on the second file. It does this for all the files in the subdirectory. If you have nearly 60 files to copy, that's a lot of time-consuming head-shuttling. ARCD files are all stored sequentially in the same file, so UNARC.COM need only consult the directory once.

Here, let me shut this off and reboot so you can watch the final result all the way through.

That's great! You know, I should have joined this club a long time ago. I've been here less than two hours and I've already learned a lot.

Oh?

Yeah. Among other things, I've learned what Fast Fingers is, how it works, why it sometimes doesn't, and I've learned that sometimes the direct method of doing something is slower than the more involved one.

Glad to be of help. That's what we're here for. Now maybe you can help me.

Me? How? Where?

Right here. Let's see. I've picked up the wrench, piston and flange, which I'm sure I'll need later. I've taken care of the 4-inch man-eating amoebas and pacified the voracious junkyard dog. Now, how do I get some light into this cave, and what the heck am I going to do with this Grommian Sling-Stacker Coupon???



QWK8: Offline Messaging for the Stock 8-bit

Review by Robert Stout

Internet: rslout@legend.akron.oh.us

Genesis

I would like to thank Bobby Clark for including a nearly complete description of the format of a QWK packet in his docs for *QWKSilver*; otherwise, I would have had no place to begin. Unfortunately, I could not get *QWKSilver* to run. And *PabQWK* was no option for my 64K XL. Hence, *QWK8* was conceived. (This was before I found a 130 XE at a thrift store for \$15, and before I was offered an AT&T PC 6300 with a 20 meg hard drive for \$200).

QWK8 is a QWK-packet message reader for the unexpanded 8-bit Atari. *QWK8* is programmed in C, specifically ACEC using the CC8 compiler. CCOMPILR.ARC and C__LANG.ARC are the files in which I found this version of C. *QWK8* uses linked lists and dynamic memory allocation by way of malloc() and free() routines adapted from K&R (Kernighan and Ritchie, *The C Programming Language*). The source code was posted with the program to various commercial services and to the archives at the University of Michigan (umich).

I succeeded in incorporating virtually every feature into *QWK8* that I wished, save one. I had to delete a portion that printed pages of message subjects and authors, and then allowed one to jump to a selected message. The buffer size was getting small. There is a SpartaDos 3.2 version I put out which does contain this portion, along with an attempt to write a nonstandard note and point for those with hard drives, but I can't really say if it works since I was unable to test it on a hard drive.

Description

The process of using *QWK8* involves some preparation, mainly downloading a QWK package from a BBS and decompressing it. From *QWK8*'s opening menu, load the CONTROL.DAT file from the decompressed QWK packet. This takes you to the next menu where you may either post a message to a base or scan the MESSAGES.DAT file building a linked list of pointers that can later be saved in QWK8.DAT. If you leave the program and return, you won't have to scan the MESSAGES.DAT file again, just load the QWK8.DAT file. By choosing the "mark" option while reading messages, you may save a pointer to the current message being read in LASTREAD.PTR, exit the program, then return and continue reading from where you left off by loading the LASTREAD.PTR file. You can quote, print, edit, and save messages, and load text files of the atascii variety into the editor or onto the end of what is in the editor.

After loading the CONTROL.DAT file, scanning the MESSAGES.DAT file (or loading QWK8.DAT), if you then choose to read messages, you will see a list of bases from the BBS with information about each base. The range of message

numbers is given next to the name of each base and sometimes a mark will appear beside a base indicating that it contains a message to you. In order to insure that such an indication is given, it may be necessary to check the CONTROL.DAT file to see if the format of your name as given there is the same format as your name in messages addressed to you. Case matters. If the names are different, either edit the CONTROL.DAT file or notify your sysop of the discrepancy.

Since *QWK8* runs in 40 columns, when editing a post, reply, or quote, take care to set columns to 80 if you want your work to show up in 80 columns. Here's an example of what I ran into. Before I downloaded a message packet from my local BBS, I had to set my screen width to 80 INSIDE the BBS message reader, the place where I used the BBS editor. That place did not have the same settings as those in effect when I entered the BBS. In other words, the download may be formatted differently than one expects. Secondly, I read my message packet in 40 columns in *QWK8*; and, finally, I typed my replies in 80 columns, in *QWK8*.

QWK8 will save replies in packets in the QWK format with the given BBS name. You may overwrite, or add to an existing reply package. However, you must recompress the packet yourself into a file ending in .REP, and containing the name of the BBS, e.g. RCA__BBS.REP, (RCA__BBS, my local Atari board). Then upload the .REP packet to the BBS!

Technical Notes

Even with SpartaDos 2.3 and its incredibly low memlo (4K lower than MyDos!), overflow may occur with messages beyond 8K in size or thereabouts. *QWK8* will let you know when this happens. In most cases, error messages are sparse and terse. Errors are noted if the CONTROL.DAT or MESSAGES.DAT files are corrupted or in some way altered, e.g., *QWKSilver* rewrites the CONTROL.DAT file with atascii carriage returns, eliminating the MS-DOS carriage returns. Such a rewritten CONTROL.DAT file would not be acceptable to *QWK8*. Once I encountered a MESSAGES.DAT file with one byte dropped. Such a file produces garbage at the point where the sequence of 128 byte packets in a MESSAGES.DAT file is in any way nonconforming.

Conclusion

That's it. *QWK8* comes in a plain vanilla wrapper (no fancy screens or windows), and while the taste might be sweet for some SpartaDos 2.3 owners (bigger buffer), MyDos users (smaller buffer) and hard-drivers (can't read message packets greater than 64K) may find the flavor not as sweet. Might whip up a newer batch someday.



IceT: 80 Columns Without the Flicker

Review by Kent Johnson

CompuServe: 72750,1027

IceT Is a Work in Progress

It is fun, useful, educational, and fully Atari in every way. What I mean by "Atari" is that quality of happy do-it-yourselferism that got Californians named "Atari Democrats" in the race against Walter Mondale back in the olden days. The dictionary definition might read: Atari: [at-tar-ee] adj. Progressive transitional appliance utilizing inexpensive but powerful and eloquently efficient components with surprisingly wide applicability.

IceT Is Innovative

It comes with an 80-column reader, also a work in progress. I use my son's Atari with a Black Box and hard drive on a 19 inch color TV (and he uses my IBM, a happy arrangement). But to use the Reader program I went to a second hand store and bought a composite color monitor for \$20 and installed it in my daughter's room. But I am getting ahead of myself.

To get a copy of *IceT*, I downloaded it from CompuServe, my second home for the past five years. It is called ICET.DCM, which told me that I had to run DISCOM.OBJ in order to change it into a usable group of files. Those of you who have not used Bob Puff's *Discom* should understand it changes a single DCM file into an entire disk. You need to have an expendable floppy ready when you run it, or you will probably format and destroy whatever happens to be in D1: when you load it. Careful.

Then the Fun Begins

You will have a group of files, one of which is enormous by Atari standards, ICET.DOC. It will not load into normal memory on *TextPro*, the only worthy Atari word processor, in my opinion. If you load it in *TextPro*, you get the majority of the file, but not all of it. But it works fine in *READER.COM*. Strange. Maybe one day I will try to find out why. Anyway, the trouble with *Reader* is, even though Chamiel calls it a "Reader," I could not read it. I could almost make out that there were words there; however, they were so small I first thought they were just garbage characters and sent my first email to Itay Chamiel, the author.

I was not able to read the docs file on the *Reader* until I bought the composite monitor I told you about. Then I could read all but the strangest characters (kind of like life). I had to do it, however, to figure out how to load *IceT*. So, if you can't read on the *Reader*, load it into *TextPro* and the first page or so will tell you how to configure *IceT* for your computer.

IceT does not work with SpartaDOS. I like Sparta very much, especially on systems that do not have super fast drives. But when I load *IceT* with Sparta, I get the introduc-

tory screen, then nothing. Freezeville. I am sure someone will soon make a Sparta version. If I ever get any time, I might do it myself. (I'm just bragging!)

But *IceT* works fine with MyDOS, the most versatile Atari DOS. So load MyDOS (or get MyDOS if you don't have it. It is available anywhere you can get *IceT*, surely) since if you don't have it you should. *IceT* does work with any DOS except Sparta, according to Chamiel.

Load *IceT* with your modem on (or you will get error messages) and be sure to load all the necessary drivers (if your modem needs a driver to run on an Atari) and then you get the *IceT* intro screen. I recommend that you go immediately to the options menu and change the screen to "inverse," that is, a white or yellow background and dark letters. This makes the screen readable. If you could change the background on the *Reader*, you would be able to read the *Reader*. This is the first feature, I would suggest, is needed for the *Reader*.

One thing to try at this stage is all of the sparse functions in the menu bar. There is not much there, but I do like the directory menu. It has four columns, and shows the filename.txt in all lower case letters. Neat, especially for large directories. But there is no copy, delete or rename from the directory screen. You must remember any filenames you want to work with.

There are no functions to speak of yet in *IceT*. Chamiel says he will have to finish school before he can add any dialing menus or macro capability. So, if you are going to use *IceT*, you are going to have to have intimate communion with your modem manual. All I ever did was dial numbers, however, and you must keep a piece of paper handy. If you get a busy signal, the modem will tell you, but you will have to re-type the commands. ATDT 555-5555 will dial the phone number, tone dialing. It is really the only command you need. And since Xmodem is the only available file transfer protocol, there is not much more to say--except . . .

It's cool to see the simulations of VT-100 (Ansi mode) terminal emulation. There is no way you can see this without *IceT*, as far as I know. One local BBS is called "The Firehouse" and has a graphic of a fire engine when you log on. It was amazing to see that graphic on the Atari. I could really only tell what it was because I had seen it before, but it is a reasonable approximation of Ansi graphics, and makes *IceT* worth getting. Of course, it would be more worth getting if it had a dialing menu, some more DOS-like features, and a macro capability, as well as Z-modem operation (am I dreaming?). But it is a good start.

(Continued on page 51.)



FlickerTerm: "Surfing the Net" in 80 Columns

Review by David A. Paterson

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The media today are filled with two very different paradigms for the ongoing information revolution. On the one hand, we're told about "the information superhighway," promising to revolutionize the way we do everything from banking to relaxing. On the other hand, we read about "surfing the net" where young hackers roam cyberspace. Personally, I like to combine the two, and go surfing on the information superhighway. It can be a bit risky (you have to dodge those big rigs) but it's a real rush when everything goes right.

But to be a surfer requires the proper equipment. The most fundamental is a good surf board. And now, by combining my Atari 800XL with Earl Halliwell's *FlickerTerm* program, I've got just what I need. You'll often find me cruising around the Usenet Atari discussion groups. Late nights mean that I'm gophering around the University of Michigan Atari archive. Or maybe I've telnetted to a MUD (multi-user dungeon) somewhere in New Zealand. I'm riding the wave of the virtually limitless options of the Internet, due in no small part to *FlickerTerm*.

There are many good terminal programs available for the Atari 8-bit. *BobTerm*, *DeTerm*, *Express!* and *VI850* all provide a wide array of functions. But none can offer high-speed 80 column display. The XEP-80, banging bits through the joystick port, can't keep up with modern 9600 baud modems. The other alternative, until now, was to have graphics 8 screens with bit mapped graphics, a painfully slow process.

FlickerTerm gets away from the old methods of display. In an ingenious hack, *FlickerTerm* rapidly changes between two Graphics 0 screens. By using a carefully designed character set, and by fine scrolling exactly half a character width, *FlickerTerm* displays 80 columns on screen. After seeing *FlickerTerm*, I wrote a small interrupt to do the same thing. It's a brilliant idea, very well executed. I use a generic 9600 baud modem with data compression, and *FlickerTerm* has no problems keeping up. The display does flicker, though (hence the name). In a darker room, it isn't very noticeable. But in daylight the screen can be a bit hard on the eyes. The alternative 80-column displays show only gibberish at 9600 baud, though, so it's really no contest if you want high speed.

You don't get a full-featured program with *FlickerTerm*, though. It's still under development. The current version permits you to set duplex, baud rate, key click, translation, which R: port to use, as well as a number of other parameters. But it lacks some of the basics of a terminal package, like a capture buffer, file transfers or even a dialing list. It's ATD555-5555 for each number you want to call. Dealing with busy signals and constantly retyping numbers forced me to my modem manual (imagine, reading the instructions!) to discover the A/ command, which executes the previous command.

You can customize the appearance of *FlickerTerm*, setting your preferences for the cursor, selecting methods of display for inverse text and generally tweaking the program to your taste. It's obviously being written with a great deal of care, and a great deal of attention to the individual user.

Using *FlickerTerm* is simple. After loading, you're in terminal mode. Whatever you type goes directly to the modem. If you're stuck for what to do, press and hold down OPTION and press H for a help screen. There are keyboard shortcuts for most commands, but I usually press OPTION-T for the terminal menu where I can make whatever changes I want. OPTION-Q leaves the program but doesn't drop the line, so you can easily switch to another program to do captures and transfers. Provided you don't use the XEP-80 handler, *BobTerm* works all right, though most VT100 commands have mixed success.

FlickerTerm supports three translation modes: VT100, IBMPC and ASCII. I've used a few other VT100 emulators, on the PC and the Atari 8-bit, and *FlickerTerm* does better than any other I've ever used. I've had no problems logging on to my university library or on to my university mainframe. Compare this to IBM-PC programs that I've tried, developed by "professional" software houses and sold for high prices. I've yet to find one that does VT100 as well as *FlickerTerm*. I've "surf'd the net" and never once wiped out . . . or at least never wiped out because of the terminal program I was using.

FlickerTerm is a small program. There are only three required files: FLICK80.COM, the main program, FLICK80.FNT, the custom font required, and a configuration file. I keep all three in a sub-directory. I've encountered an occasional problem with the program reporting that it can't find the font file. It only surfaces if I've previously run *Kermit*; I believe *Kermit* doesn't properly close all the channels it used. Switching out of the sub-directory and returning seems to fix the problem.

To get full value out of *FlickerTerm*, you'll need some other terminal program to handle file transfers. My university supports *Kermit*. Others support Xmodem, Ymodem or Zmodem. So don't discard that *BobTerm* disk just yet.

As it matures, *FlickerTerm* promises to become a standard for every user of a Classic Atari. The next version (according to the Usenet discussion group comp.sys.atari.8bit) will support on the fly ROT-13 decoding, and might include Xmodem transfers.

FlickerTerm is very much a work in progress, and it is difficult to properly review. Earl Halliwell is always seeking user feedback for ways to improve his program, and adds fea-

(Continued on page 51.)

Constraints Improve Art

by Joe Walsh

Internet: ransom22@delphi.com

I recently happened upon a rather wonderful insight. It specifically applied to one art form, the novel, but it can be applied equally well to computer programming.

Is Programming an Art?

Most people don't believe that programming is an art. The way lines of code are churned out in Redmond, Washington makes that no surprise. To them, programming is mere science; just a formula to be followed. They are not alone in this belief. In colleges and universities, programming courses are listed under "Computer Science." But the anti-art programmers don't just fall into this one category of belief. Others have labelled programming as being more akin to engineering. Thus, we get the term "Software Engineer." These views hold sway to such an extent that the only art you are likely to find at the neighborhood computer superstore is on the box the program is packaged in, or on the gee-whiz graphics display of the latest game on CD-ROM.

But, even as the advent of mass-produced posters did not mean that oil paintings suddenly disappeared from the art world, the adoption of programming as "Computer Science" or "Software Engineering" does not make programming as an art an impossibility. It merely makes it rare, and thus more valuable.

I would love to gaze at the 8K of code that manifests itself as the menacing ships and fascinating starfield of *Star Raiders*. Imagine how different it must look compared to the multiple megabytes of bloated code that is the standard issue of Redmond. Programs (like posters) can be art, but they do not have to be.

A Novel Idea

If we agree that programs can be art, then what is this startling idea that I alluded to above? The idea comes from France, and the author, Georges Perec. His novel, *La Disparition*, and its English translation by Gilbert Adair, *A Void*, are both lacking one thing: the letter *e*.

In French, as in English, *e* is the most frequently used vowel. So, by choosing to use only those words that do not contain the letter *e*, the author undertook a difficult task.

It was Mr. Perec's feeling that constraints improve art. He had written poetry, and the constraints on that form had inspired his imagination. When he decided to write a novel, however, there were no inherent constraints. He had not only the entire language to work with, he also had virtually unlimited space. So, he decided to impose this constraint on himself in the belief that it would inspire him to greater imagination, and thus improve his art. Indeed, it did.

When I first learned of this, I thought it was a rather eccentric thing to do. Lacking the words which contain the let-

ter *e*, I thought it would seem somewhat awkward when read. Wouldn't the reader notice the strangeness of the novel immediately? Wouldn't there be a strained quality to the text?

Once I read it, my preconceptions were shown to be faulty. Not only was the text not strained, it seemed to be unrestrained. In effect, the author's choice to avoid a large portion of the language had improved the novel he wrote. By discarding a major portion of the language, he was forced to choose some uncommon words at times. Writing in this manner caused the author to stretch his imagination, improving his writing. Similarly, reading his words is a refreshing change, and, in turn, serves to spur the reader's imagination.

Extending Perec's Idea to the Atari 8-Bit

As I reflected on this book and the technique used by Mr. Perec, I realized his was a brilliant idea, and that it could be extended to all areas of art. It also made a great argument for the use of Atari 8-bit computers.

Anyone who has seriously coded on an Atari 8-bit knows that they are wonderful computers to program. There are extensive capabilities built into the hardware in order to aid the programmer in his task, such as player/missile graphics, scrolling, and more. Even so, we all keep beating our heads against that 64K barrier. Isn't that an inadequate amount of space to put a program in?

Drawing on the perspective offered by Mr. Perec, we can see that this constraint may be more of a benefit than a liability. It may be the reason that the software of yesterday is generally higher art than that spewed forth today. The programmers of years past had to work hard to fit all their ideas into a small space. They had to think of creative ways to get more and more done within the constraints of the machine's architecture. To be sure, not all of the programs produced a decade ago were great art, but they were art nonetheless.

Pretend that you are writing a program for use on today's computers. If you need a sorting routine, why bother coming up with something really clever that sorts using very few instructions, very few machine cycles, or both? Simply use the "bubble sort" method, as it is easily implemented. The extra time that routine takes to do its job will never be apparent to the user (who undoubtedly owns a computer with a processor that is fast enough to handle it in a fraction of the blink of an eye, and with enough memory to store even the most bloated of programs).

Atari: The Artist's Computer

This is the crux of the matter: the pundits and academics are right; programming is no longer an art. It does not have to be. Software houses do not have to pay for the best talent in the field, because the machines don't require it. Agonizing over a few instructions is frowned upon, as the labor costs do not justify it. The nature of the economics involved dictates that programs produced commercially will be science or engineering rather than art.

Programming only becomes art when there are constraints. Oh, it is possible to program artfully on today's ma-

chines, but there is no reason to do so. There are economic disincentives for programming artfully, given the reality of current computer technology. On the other hand, Atari computer programmers are artists, because they have to be. Or, perhaps they are programmers of Atari 8-bit computers because they are artists.

So, if you want to be a "Computer Scientist" or "Software Engineer," work on the Macintosh or MS-DOS/Intel platform. But if you want to be a Software Artist, stick with your Classic Atari.

Bibliography

Perec, Georges, *La Disparition*, published in France by Editions Denoel, paris, 1969.

Perec, Georges, *A Void*, translated by Gilbert Adair, published in Great Britain by Harvill (an imprint of Harper Collins Publishers), 1994.

FlickerTerm (continued from page 49.)

tures based on user demands. By the time you read this review, it'll probably be out of date. I can only encourage you to get *FlickerTerm* and try it out for yourself. You won't be disappointed. And, if you should find yourself surfing the net, or even just taking a Sunday drive down the information super-highway, drop me an email.

[For this review, I ran *FlickerTerm* under SpartaDos 3.2gx on a stock 800xl with XF551 drive, hooked up to a 9600 baud modem via R1: on an 850 interfacce.]

Ice-T (continued from page 48.)

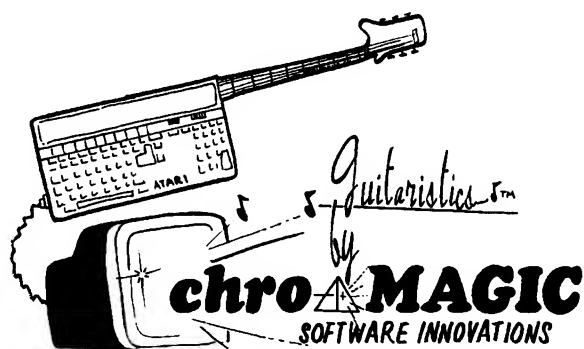
So, I will send my registration fee to Chamiel in Jerusalem and I hope many more of you will also. He deserves it for a fine effort. I still use *BobTerm* because of the dialing menus, of course, but I like 80 column print and Ansi emulation. I hope it comes our way soon.

Editor's Note:

Since I received Kent's review, a beta version of *Ice-T 2.0 XE* has come out. It includes all the features of *Ice-T 1.0* plus a few more, but its basic requirement is that you have 128K. According to Itay Chamiel, version 2.0 includes the following:

- * Faster, but *still* not good enough for 9600
- * Eight-page backscroll buffer, as opposed to just one
- * Fixed one or two annoying bugs, but some are still there
- * File viewer allows fine scrolling
- * 16K capture buffer
- * Xmodem download completed
- * PC character set for all chars above 127 (toggleable)
- * Dialing menu; You need an external text editor to create and edit entries (up to 20)
- * Final version will include a *good* macro capability
- * Ability to quit to DOS and load Kermit-65 or Atar-Z-Modem

Ice-T 2.0 XE can be requested directly from Itay Chamiel via his internet account: bruck@brachot.jct.ac.il



Guitaristics version 1.93

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The Swift Report: *Another Look*

Review by Joseph E. Hicswa

Prologue

Although fascinated by Atari 8-bit computers for more years than some youngsters have lived on Earth, my knowledge of spreadsheets was limited to seeing that word in magazines and catalogs while flipping the pages.

I really did not understand a spreadsheet, its purpose and advantage until *Current Notes*' 8-bit editor, Rick Reaser, asked for volunteers to check out and write another review about the *Swift Spreadsheet*. I volunteered.

What is a spreadsheet? Here's my definition: It is a combination of calculator, to manipulate numbers, and text, to identify those numbers as in bookkeeping journals and ledgers. The electronic spreadsheet is displayed as a grid of cells. (Each screen like a page; each cell like a line). Cells are identified as: A1, B1, C1, A2, B2, etc.. Numbers are entered as digits (0-9) or arithmetic formula (+, -, *, /). Cells containing numbers become variables that are used by other cells. A plus sign precedes the algebraic variables to distinguish them from text, e.g. +J32/.17 or +D12-B17.

Text is entered with alphabet characters (A-Z). A quote precedes non-alphabet characters to identify them as text not arithmetic symbol, e.g. "++++ or ---- (used as line separators).

The advantage of a spreadsheet is that, after it is set up (formatted), a single number entry is instantly calculated in all related cells to give immediate results.

The Package

The package contained a colored *Swift Spreadsheet* cover, a disk with Atari 800XL and 130XE versions of *Swift*, Micro Swift Spreadsheet Instruction Manual and a price list with an abridged description of *Swift*. *Swift* is also available on cassette. The 800XL has 26*254 cells labeled from A-1 to Z-254. They can be transferred back and forth between 800XL and 130XE computers. The 130XE version has 64*254 cells labeled from A-1 to BL-254. Cells AA through BL will not load into the 800XL. The description claimed, "Graphic display option--Converts cell values into bar graphs. *Swift* is programmable. Additional commands can be added to pop-up menu system through the use of MACROS." (However, I could not find GRAPH or MACRO procedures in the literature or manual.

There was also a letter from David Wyn Davies of The Atari Classic Programmer's Club, Wales, United Kingdom. Mr. Davies stated that *Swift* can be installed on a hard drive even though it has some simple copy protection. He explained that *Swift* is being considered for 3.5" disks for

owners of the Black Box and floppy board. Also, a 3.5" drive interface is produced in England that could be "generally much cheaper than reconditioned 1050's."

Initial Boot-up

My ATARI system is strictly 8-bit: 130XE, 810 and 1050 disk drives, Atari XDM121 (daisy wheel) and Epson 5000 (24-pin) printers. The monitor is a 12" Emerson B/W TV. Two disk drives, 130XE RAM DISK, XLENT WP and Atari DOS 2.5 were very helpful. I'm grateful to all who made it possible for me to use them.

After the *Swift* package arrived, I hastily removed the 5-1/4" disk, inserted it into drive #1, and switched the system on. The disk contains two Atari versions: 800XL (64K) and 130XE (256K); side 2 is not an Atari format.

As the program loaded, *Swift* automatically discerned my computer was not an 800XL but a 130XE and it put that version into RAM. (Gosh! How do they do that?).

A list of *Swift* Menu Editing Keys and Functions are displayed on screen during the loading. When finished, a prompt flashed on the screen, "Press any key to continue." I did.

Instantly, a blank spreadsheet appeared, but nothing else happened. I looked at it, it looked at me. Then in stern voice I commanded, "O.K. SHOW ME WHAT YOU CAN DO!" Nothing happened. The mute sheet just stared blankly.

Sometimes I wonder about the intelligence of "intelligent" "smart" computerware. It was then that I decided to open the manual and learn how to motivate that dumb thing.

Trial and Errors

I quickly flipped the manual pages, found and tried the "simple example." It is not so simple.

The manual and sample worksheet have errors, omissions and typos. This may be frustrating for new and experienced users who get nervous and excited. It is also a challenge for readers who enjoy looking for problems and solving them.

The manual contains information to learn and use a spreadsheet and resolve the *Swift* spreadsheet problems. Solutions are there. All you have to do is just find them. Despite that, *Swift* was easily learned by this first-time, spreadsheet user.

After overcoming the sample spreadsheet challenge, I read the manual in earnest.

Getting to Know Swift

The manual was comfortable and easy to read whether standing, sitting or lying down. There are simple instructions, workable samples of functions and commands. It led me through a complete, simplified worksheet.

Drawbacks of the manual did not detract or degrade the effectiveness of *Swift* spreadsheet. Despite the problems, it is simple and easy to use. *Swift* is a small utility that does a big job. My compliments to the authors, editors and beta testers.

The List of Contents and Index contain page numbers where information can be found.

The student/user learns how to enter text, numbers, and formula into spreadsheet cells.

Manual explanations and instructions are "comprehensive and comprehensible." (I got that one from literature in the package).

The Menus

Swift spreadsheet contains easy, key-press, pop-up menus that took me through a range of processes.

START KEY	—	goto menu mode
HELP KEY	—	down one option line
SELECT	—	up one line
START	—	activate that line
SHIFT+START	—	(exit menu mode)

Commands and Functions are listed in the Index with page numbers where each is explained, with examples.

Printing

When printing my practice spreadsheets, I found that columns overlapping the paper width were not printed. This was resolved by limiting the number of columns and keeping that block of cell-widths less than or equal to the 80-column paper. Total column widths of cells A1-F1 should be equal to or less than 80. (I did not try condensed print.)

Potpourri

Swift is primarily a financial tool, but can be used for other applications. Here are some ideas I came up with:

- * Some people could use *Swift* to track their stock via daily/weekly/monthly volume and prices.
- * Fuel consumption could be calculated for different conditions: weight, speeds, wind direction, gravity (going up or down), atmospheric temperatures, etc.
- * Bankers and realtors can immediately learn interest payments and amortization of loan or mortgage at various interest rates for different lengths of time.
- * A biologist might seek theoretical results by altering atoms in a molecular structure.
- * Engineers would get instant results when altering their formulas.

- * Maybe musicians can compose music scores for different instruments.
- * Racetrack fans should find *Swift* an interesting way to determine their bets.
- * How about Casino players using *Swift* to learn best combinations on roulette wheel, poker hands, dice table, etc.

The efficiency of *Swift*, like any other program, is determined by the user's thorough understanding of the manual and practice, practice, practice.

Every computer user needs a spreadsheet program in his library. There always comes a time for its need. The *Swift* program is like insurance.

Epilogue

Now I know what a spreadsheet can do and how to use *Swift*.

It was exciting, sometimes frustrating, to be both teacher and student as I taught myself and learned the *Swift* spreadsheet. Running into a problem with no one around to solve it—I had to do it myself.

The *Swift* package was a rebus; data contents like pieces of a picture puzzle. I accepted the challenge to assemble them into this review.

Did I enjoy doing this? You bet I did! Sometimes more than others.

Thank you, *Current Notes*, for adding something new into my life. Now, does anyone know how I can make a macro to generate random numbers in a *Swift* spreadsheet?

Availability

Standard Swift -- This is the original version of *Swift* with the system disk, Commodore 64 manual (there wasn't an Atari-specific manual), and an Atari keyboard reference card. 9.95 Pounds Sterling (\$16.95 US Dollars) to non-members, 7.95 Pounds Sterling (\$14.95 US Dollars) to ACPC members.

New Swift - This contains the system disk and a new 40 page, A4, comb-bound, Atari-specific manual. 12.95 Pounds Sterling (\$21.95 US Dollars) to non-members, 10.95 Pounds Sterling (\$18.95 US Dollars) to members.

There are currently two disk formats available--standard Atari 5.25" single density and a 720K 3.5" disk. Please specify which format you require when ordering. There is no price difference. A cassette version is in the works,

For further information, contact:

The Atari Classic Programmer's Club
Pen-Tyddyn, Capel Coch
LLangefni, Anglesey
Gwynedd, Wales LL77 7UR
United Kingdom

Internet: mbitdc9306@newi.ac.uk (David Wyn Davies)



Music and Technology

by

Gary Woods

HOT STUFF

Over the past few months, I've been updating my studio. I've cast a covetous eye toward the 32 Input Mackie 8 Bus Mixer, and the Fostex RD-8 digital 8 track, along with some other goodies that would look just great in my rack. The substantial market penetration of the ADAT format amongst musicians and the built-in synchronization of the RD-8 finally drove me in that direction. Now I hear you saying, "hey big guy, with all that money you make from writing these swell columns, and incredible recognition you have in the industry, I bet they just rushed that gear out to you as soon as they heard you wanted it." Well, I guess again. Sure, the big money and fame are nice, but I'm still out there with my nose pressed up against the glass like everybody else.

When I started looking around back in July, the RD-8 had just begun to be released in any quantity, and the first quote I got was for \$4,100 on a \$4,995 list item. The store said that they had three coming in and two were already promised, so, if I wanted one, I had better hurry. Well, this wasn't too thrilling a deal, so I decided to wait a while. Besides, the mixer I wanted, the Mackie 8 bus, hadn't become available.

Then, suddenly, the deal on the Mackie came through, which is a story for another day, and I was definitely in the market for that Fostex RD-8. The tech I hired to wire my studio called me and said there was a brand new, in the box, RD-8 in the paper for \$2,800. This is a great price for this unit, and substantially below wholesale. Well, the number in the paper led me to a voice mail box, which led me to a pager, which led me nowhere. The weekend came and went and I figured the unit was already sold and I'd have to look elsewhere.

The next thing I know, my tech is on the phone saying he got a hold of the guy with the unit; he still had it, and was ready to sell. About this time, my "If it seems too good to be true, it probably is" sensors popped up. As some of you may remember, I'd interviewed the people from Fostex concerning their foray into rotary head digital technology for another column, so I had some contacts inside the company. I called them and asked if they were aware of any stolen merchandise out there floating around the countryside. They told me they weren't aware of anything presently, and that the only one that had been stolen had been recovered. We finished the conversation by their telling me to get the serial number of the merchandise before I did anything.

The next day, I got in touch with the individual selling the unit and asked him for the serial number. He gladly went out to the car, got the recorder, and read the serial number to me. I told him I'd get back to him, and that I was going to call Fostex and check the number. I then called Fostex and gave them the number. After about two hour's wait, they called back and said the machine was clean. They said it had been sold to a dealer in Texas in March, and had not been reported stolen. I then asked them what they would do, and they said it's a heck of a deal; they would take it.

By that time, it was late in the afternoon. I called the individual with the unit and told him it was too late that day to get a cashier's check drawn up and suggested that we wait until tomorrow to complete the transaction. The individual assured me that a business check would be satisfactory, and I made arrangements to meet him down the street from my house, still feeling that something was wrong.

About a half an hour later, parked in my battle cruiser family station wagon, I'm waiting, patiently, when up drives a young man accompanied by his girl friend. They are in a late model German luxury automobile with a car phone. The young man is articulate and well dressed and seems to know the equipment very well. I'm still thinking there's something wrong with this deal, having heard stories of people being sold rocks instead of the television set they thought they were buying, so I ask him to open the box. Well, the unit is there, the warranty card is there, everything is just as advertised. I hand him my business check for \$2,800, shake hands and drive away happy as a clam.

For the next two days, I'm going through the manual, learning all the features of my new found treasure. Somewhere along the line, I realize the software that is in the unit is not the most recent. So, I call up my friends at Fostex and say, "Can I get the update." They say sure, bring it down and we'll install it for you. So, I throw the unit back in the battle cruiser, and hop on the road to Norwalk. After a few minutes of waiting in the lobby, out comes my buddy who says, "We've got bad news. That unit you brought in was hot and we're confiscating it." Suddenly, my life is flashing before my eyes, and my \$2,800 is speeding away. The Fostex guy says, "You better get down to your bank and see if you can stop payment on that check." In a cold sweat, I beat it down to the local B of A, thinking all the time that I'm dead meat and this sucker must have already cleared. Well, guess what . . . It

hadn't cleared. The guy that I had given the check to had deposited it in his bank and it hadn't worked its way around to me yet.

Much relieved, but still shaken, I called the guy from Fostex back to find out what was going on. Evidently, the scam involved the perpetrators calling up out-of-state distributors and having them ship merchandise, which was then paid for by stolen cashier's checks. The perpetrators would already have ads in the paper so that the merchandise would be sold that weekend, before the cashier's checks ever reached the original store. Add to that the fact that, even after the store deposited the cashier's checks, it would be some time before they were returned as being stolen.

Over the weeks, I kept in touch with the people from Fostex to track the course of the investigation. Soon, it became evident that the scope of the scam was quite extensive. They told me that there were several hundred thousand dollars of stolen merchandise involved. Also, not only were the crooks content to deal with out-of-state stores, there were several reports of them buying merchandise off of local musicians with those same stolen cashier's checks. I heard one story of a person selling his brand new Mackie 8 bus mixer to these guys, which means now the musician has no mixer and no money. Also, I heard of another unsuspecting buyer who went to the home of the same individual I purchased the unit from, and gave that individual close to \$2,700 in cash. The buyer called up Fostex to register the warranty, only to be told he was in receipt of stolen property. So, unlike myself, this fellow has no money and no tape recorder.

A very disconcerting sidebar to this was, once my check was returned to the individual that I bought the stolen tape recorder from, he called me up and wanted to know what was going on, and why had I put a stop payment on the check. I told him the story of having the merchandise confiscated, but he continued to call me several times after that.

Recently, the individual I dealt with was brought into custody, and a whole layer above him was discovered. It seems there are some big time computer hackers that are really running this show, and the person I dealt with was simply a distributor. What this means for you is that they're still out there, and if something seems too good to be true, it's at least a good idea to step back and do some checking before you make that deal. Unfortunately, for unsuspecting musicians in large metropolitan areas, it is somewhat common to see people buy something, only to turn around and dump it as soon as a month later. So, trying to discriminate between a scam and some crazy who just wants to move a piece of gear out can be difficult. The fickle nature of the business is such that something could be the most desired piece of gear on the planet one minute, and Recycle fodder the next. This means that it's quite possible that a piece of equipment could be new, in the box, with the original warranty cards, and be perfectly legitimate.

To try to protect musicians from becoming a victim of somebody else's scams, I decided to solicit suggestions from

various corporations, retail outlets, and law enforcement people that I know.

1. If you're selling something, **ALWAYS GET CASH**. The Recycler clearly states this advice, and it just makes sense. Even if you get all that ID stuff like the guy at the super market, do you really want to take that person to court to try to get your money?

2. Also, if you're selling, try either putting your gear on consignment, or having somebody else sell it for you. I think most of us remember Doug Timm who put an ad in the paper only to have people show up to his house, kill him, and steal his car. The cost to you can be from 10-25% of the purchase price, and the benefit can be a good night's sleep. Besides, do you really want that dirt bag you're selling some stomp box to, showing up to your house, and looking over your collection of vintage Les Paul's? I don't think so.

3. If you're buying something out of the paper, meet him in a public place, or, at least, take a friend. Think about it, here you are with anywhere from several hundred to several thousand dollars in cash in your pocket, and you're going into some place you've never been before. Not all of these people belong to the Better Business Bureau, and who's more gullible than a musician lusting after some new piece of gear?

4. If a deal seems too good to be true, it's at least worth a call to the manufacturer to see if a piece of gear is hot or not. Even though doing this didn't help me completely avoid a contact with a scum of the worst kind, it can't hurt to check. My scenario was very intricate and new at the time we stumbled on it, and, generally, corporations keep records of stolen merchandise. If the equipment really is new and in the box, you're going to have to deal with the corporation, sooner or later, if you want to validate the warranty, so better before than after.

Finally, in closing, when thinking about buying new stuff, consider your local dealer. I know it's seductive to deal with the mail order houses, but the local person can be a source of real support. As complicated as most gear is these days, it's nice to have somebody to call when you can't figure out what that little button does, and how come the light doesn't come on. Also, they can be a good backup when something dies on you in the middle of a session. I had a power supply on a piece of equipment I purchased from a local purveyor of fine musical instruments dump on me in the middle of a date once. I called the salesman and he ran a new one out to my house within an hour. Pretty nice service for something that cost me \$400 and couldn't have made him much more than \$50. Try that on Mr. 800 number out of Delaware.

If you have any questions or suggestions for me, I can be reached at:

Gary Woods
6428 Valmont St.
Tujunga, CA 91042
818 353-7418
FAX 352-6559

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NOTES

by Lou Rocha

Hi everyone! I am pleased to step in this month since Wally is a little busy with a transcontinental move! This month's issue of GENIE notes covers the recent conferences with Dave Munsie and Howard Carson (ACE 95 Show) as well as our regular contributions from Terry Quinn (Hot Topics) and Gordon Meyer (ST Library). Hope you enjoy it.

RTC Highlights by Lou Rocha



This issue contains the highlights of two conferences held in the Atari RT. On Feb. 22 Dave Munsie held court with a discussion of his fine suite of software programs. On March 1st the ACE 95 Show was discussed with show organizer Howard Carson and TAF (Toronto Atari Federation) president Peter Zalesak.

Dave Munsie's conference began with a recap of his previous projects on the Atari platform: *Donkey Kong*, *Berzerk*, *Space Invaders*, *Frogger*, *Kaboom* and other classics like *KID-GP*, *Evader* and *Dark Pearl*. Dave announced his new shareware policy that all titles have a flat rate shareware fee of \$10 per product.

Current products include the following: *Frantick*, an exciting shoot-em-up; *Asteroidia*, an update of *Asteroids*; *G_Shell*, GFA BASIC programmer's shell; and *Multi_Run*, GEM/Multi TOS compatible program launcher. Future products include *Quadrys* (*Tetris* clone), *Megaspace* (arcade quality shooter) and *Choplyfter*. Dave is also launching a bi-monthly multimedia disk-based magazine that features news, reviews, programs, on nothing but Atari related products!

In addition to his Atari projects, Dave has been approached to develop Jaguar products and is currently planning on PC versions of his Atari products. Future plans also include a look at Role Playing Games which, apparently, take a lot longer to code. Other projects in Dave's dreams include a guidebook on game design and a MUNSIE CD with all of his products.

The March 1st ACE 95 conference provided some general show information and updates on attending developers. Tickets for the April 1st and 2nd event were \$6 per day / \$10 for both days and included free admission to all seminars and workshops that ran hourly from Saturday morning to Sunday

afternoon. The show itself was being held in three large ballrooms at the Novotel Hotel in the heart of Toronto.

This show received the support of Atari Corp. in the form of door prizes. National Jaguar distributor Beamscope also pitched in with Jaguar support in the form of booths and play stations.

Among the anticipated highlights were: Lynx and Jaguar exhibitions by TOAD and Scarborough Computers; *Magic-Mac* demo by Computer Direct, *SARA* and *Groliers Encyclopedia* by Anodyne and *It's All Relative*, *Calamus SL* and *Calamus for Windows NT* by DMC Publishing and a possible demo of Mosaic for the Atari by a local programmer. Seminars were scheduled around the clock by several major developers. The final list was not available at press time but some noted speakers scheduled were Al Fasoldt (*Secrets of...*), Gregg Rodgers (*It's All Relative*) and Mario Georgiou (*Calamus SL*).

One of the biggest attractions was undoubtedly to be the presence of major Atari retailers from all over North America. This promised to be a feeding frenzy for show starved Atarians. As Howard Carson commented, "... more computers in one place than anyone has seen in a looooooong time."

Hot Topics by Terry Quinn



This month's Hot topic concerns a brand new Calamus module-The 3D StereoMagic module! What is it?? Well, the following description by Nathan Potechin should give you a pretty good idea:

POTECHIN [Nathan @ DMC]

The 3D StereoMagic module allows you to create Random Dot Stereograms. The images can be created using random dots, irregular dots, repeating textures, images, computer renderings and even photographs of yourself!

The latest craze in art is now available to you from within *Calamus SL*. Create your own 3D stereo design with this interesting new module. Combine your favorite texture and image to create this exciting special effect.

Latest craze this may be, but an awful lot of people have a great deal of difficulty seeing these images. What is the best way to see them?? Well, perhaps Wally has the right idea.

ST.WALLY [Wally]

Howdy Nathan,

Here's how I do it... I look at the image... Then I get closer and look at it... Then I cross my eyes and back up slowly... Then I close my eyes, shake my head, and walk away... Just that easy! <grin>

Still can't see the dolphins for the dots...

More advice if the "Wally method" doesn't work:

T.HENRY12 [Tom Jr.]

Hey all,

I've never seen one either, but I heard on the radio (Dr. Dean Adell, BTW) a way to approach it. The way I understand it, you get real close to it, but **RELAX**, and don't focus. Then **slowly**, ever so slowly, back away. If you find yourself focusing, go back. Apparently at some point it'll all pop together, piece by piece, and supposedly you're cured from being "Stereoscopically challenged."

Listen to me, giving advice when I haven't been able to do it myself. Let me know if this works for anyone, and in the meantime, I'm going to check it out myself.

Believe it or not, some people actually CAN see the darn things. For this type of person, it's more a question of how it works rather than whether it works.

D.STMARTIN [Binary Ink]

More questions on the 3D StereoMagic Module: How does the module handle the "3-D" aspect of things? Is it color based? What kind of input gives the best results? Are there limitations on the foreground patterns that are allowed to be loaded?

Frankly, I've seen a few of these stereogram generators lately. There is a wide spectrum of quality and flexibility. Exactly what will this one do? More info, please!

POTECHIN [Nathan @ DMC]

1. The 3D StereoMagic Module handles color!
2. Mario didn't upload a color example as it would have been a rather large file. If you'd like, we can certainly do so.
3. This module allows for 3 different options:
 - a) You can create an RDS (Random Dot Stereogram).
 - b) A Random Texture Stereogram.
 - c) A repeating object Random Texture Stereogram.

Type a) is dot based.

Type b) requires that you generate a repeating texture first. This option is included and allows you to generate a texture out of just about any image you select, limited only by memory. Type c) also allows objects to be repeated within the texture-based Stereograms.

D.STMARTIN [Binary Ink]

Yup—exactly the information I was looking for. One more question: How does StereoMagic handle the color planes of the graphic files that are fed into it? For example, does it do "smooth" transitions or is there a "layered" or "contoured" effect for each color plane. Some of the best Stereograms I've seen do exceptionally smooth and very real 3D curves. (Yup, I can see them!) <G>

DMCPUBLISH [Mario]

One of the features of the module is in its ability to apply color textures and create repeats with hidden images very much like some of the best RDS based books. You can also create RDS images from renderings. One constraint is to create a rendering in gray values only and to place the light source in front of the object. You can create some very real smooth curves. I'll upload some samples . . .

And, of course, there are some individuals who really "contribute" to the overall intellectual tone of the discussion.

SAM-RAPP [Sam-030]

Hmmmm . . . Perhaps it's not the space between the eyes, Nathan, but the space between the ears! ;—) Did I say that? Yikes! ;—)

Lately, it seems as if the people who use "serious" software like Calamus are having more fun than the folks who own Jaguars. Kind of makes you wonder whether you should check this topic out, doesn't it?

ST Round Table Library *by Gordon R. Meyer*

Isolation

If you enjoy puzzle or strategy games, don't miss *ISOLA* v3.20. Written by Frenchman, Thierry Grellier, Isola (as in, "isolation") is a freeware challenge that will keep you coming back for more.

The concept is simple, as it usually is in addictive games. The playing board consists of a 6x8 square. Each of two players (play against the computer or a friend) tries to place blocks on the board so that their opponent cannot move. Each piece can move exactly one square in any direction, but the board is small and with every move another block is added. It all makes for some short, but intense, games.

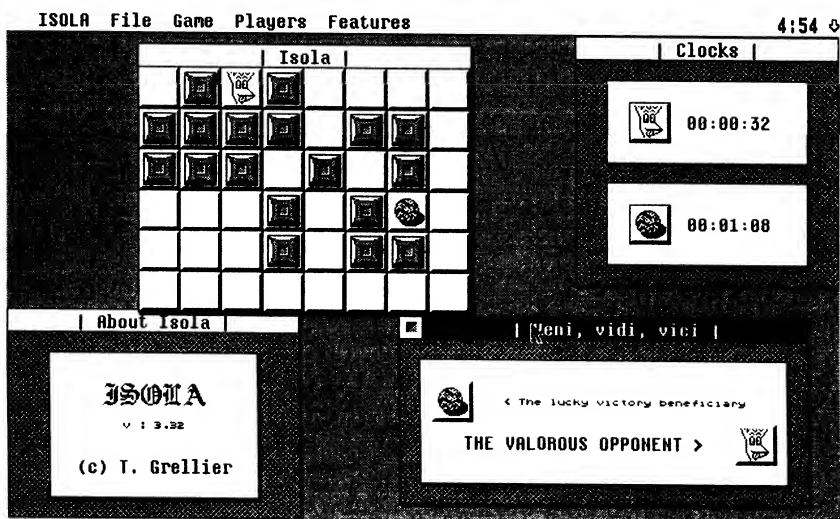


Figure 1. Isola V3.2

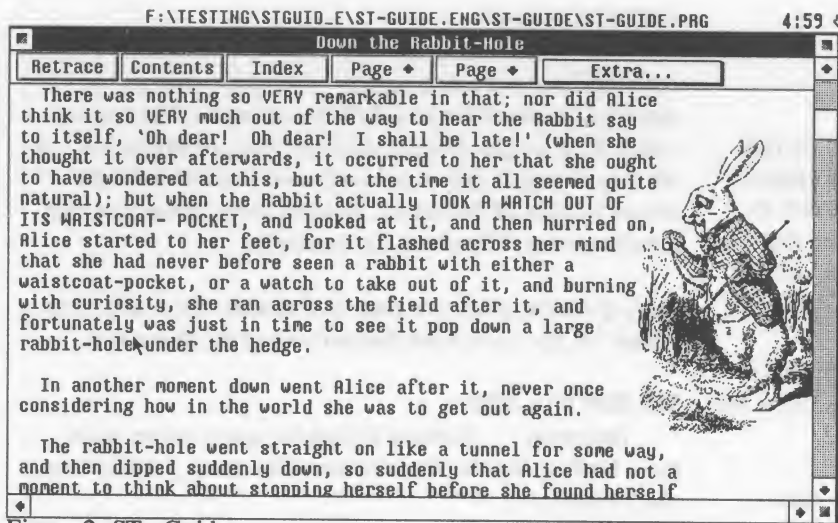


Figure 2. ST-Guide

Isola is a superb example of modern GEM programming. Everything is in a moveable window, and the hypertext-like *IST GUIDE* (included in the archive) is used to provide online help. I found only two minor quibbles: I wish there were sound effects to accompany the game; and to move a piece you only have to click on it once. Do not hold down the mouse button, as you might think is necessary because of the "grabbing hand" mouse shape.

Isola will work on any Atari ST series computer, in any resolution. Download ISOLA3.LZH, (#35137, uploaded by J.WISNIEWSK2) and give it a try. I think you'll like it.

ST Guide

One of the niftiest, but often overlooked, programs available for the Atari is *ST Guide*. Written by Holger Weets of Germany, *ST Guide* is a powerful hypertext authoring system for the ST.

Hypertext, a concept that has been around for many years, has recently entered the mainstream, thanks to the World Wide Web, *Hypercard*, and other products and services. In brief, hypertext allows you to create documents that contain "links" to other documents, pictures, or sound files. While *ST Guide* only supports text-based links, it is still a worthwhile and fascinating program.

ST Guide has become a de facto standard for much of the ST scene in Europe. Many of the latest programs rely on *ST Guide* (or its like-minded cousin, *IST VIEW*) for their help systems. But even without programs that require it, you can enjoy *ST Guide* by itself.

There are a number of excellent reference files you can download and start using right away. Books such as *Alice in Wonderland*, and documentation about the internals of your ST are available in ST Guide format. There are too many to list here; search for "Hypertext" in Library 21 to locate them. Most were uploaded by RT member J.WISNIEWSK2. The English version of *ST Guide*, with German documentation, is STGUID__E.LZH (#33065).

Atari to PC Network by Lou Rocha

Some weeks ago I downloaded a rather large six Mb compressed graphic I needed to use on my PC (blush). I had a real dilemma on my hands. How was I going to get this file on the PC? It was already compressed and I didn't have a file splitter utility that would work on the Atari and restore the file on the PC. (I later found *MEGAFLI*, but that's another story.)

After checking with the other sysops, I received a suggestion to try *Ghost Link*, not a new program but one that had been tried. With absolutely nothing to lose, I downloaded *Ghost Link* from Library 2 in the Atari RoundTable and was surprised at its ease of use. The only hardware I needed was a 9-pin serial cable and

a null modem adaptor. The two pieces cost less than ten bucks.

Although the program was written in Belgium, the documentation was in English. Thank goodness! I followed the instructions and hooked up one end of the serial cable to the Serial 2 port on my STE. The other end went into the null modem adaptor and then into the COM 2 port on the PC.

With cabling in place, I copied the software. *STMASTER* went on the root of my F:\ drive although I could have put it anywhere. The companion program, *PCSLAVE.EXE* went on the root of the PC's D:\ drive (see figure 3). I ran *PCSLAVE* first and set the configuration for COM 2 by pressing the [2] key. Next, I set the port speed to 57,600 baud to match the recommended setting for the STE Serial Port 2. Setting the speed required me to press the [F9] key. Speeds range from 300 to 115200 baud. The PC was set!

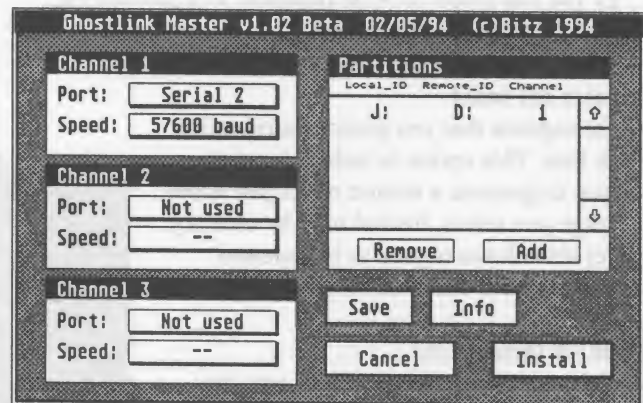


Figure 3. Ghostlink Master Program

Back on the STE, I ran the STMASTER.PRg and was greeted by a simple dialog box (see figure 4). On the left side, I set the port to Serial 2 and chose a speed of 57,600 baud. On the right side, I had to install the settings for the remote PC system.

Clicking the Add button brought up the Partition settings selector.

On the top row were the available driver letters for my Atari; I chose J:\. I selected D:\ drive on the PC as the target drive for copying my file. Returning to the first dialog box, I clicked the INSTALL button and all was ready to go!

On the Atari desktop I pressed [Alt][J] and a drive window opened with a busy bee pointer. Over on the PC I could see a directory listing scroll by. I turned back to my Atari and, lo and behold, there was the directory of the PC's D:\ drive! I opened the F:\ drive window on my STE and copied the graphic file to the open J:\ window. On the PC I could see the file being downloaded in 4096 byte segments. It took about twenty minutes to finish copying at 4 Kb/sec but the file imported flawlessly into my Windows NT version of Calamus, so I know the error checking had been flawless.

Ghostlink has become one of my regular bootup programs and its usefulness has given me yet another reason

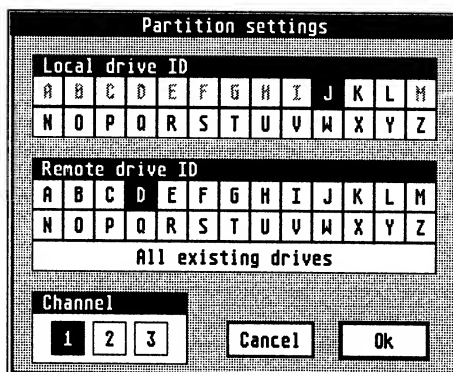


Figure 4: Partition Settings Selector.

to stick with my Atari. I regularly use PC graphics on my Atari with the help of the friendly ghost on my system.

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The Search for a Graphics Processor

A Non-Artist Looks at 8-bit Drawing Programs

by Thomas J. Andrews

GENIE:T.ANDREWS16

I've heard it said that everyone has a novel inside, struggling to escape. Well, if that's true about the verbal arts, it surely must be true for the graphic arts, as well. The trouble is we don't all possess the skills and talents necessary to bring these hidden objects out.

The time eventually came for me to find out about some of my graphic skills. Longtime readers of CN might remember an article I wrote on signmaking, where I bemoaned the lack of vegetable graphics for *Print Shop* and *Print Power*. We have a roadside vegetable stand and I use those two programs to make signs for it. Since I wrote that article, I've decided to try my own hand at some simple vegetable drawings, maybe a tomato, a cucumber, or an ear of corn. Once these drawings were produced, I could use a screen dump program like *Billboard* to print them for some of my signs.

So, I set out to find a good drawing program. Actually, the term "drawing program" doesn't quite fit what I was looking for. Word processors have released my writing from the restraints of poor penmanship and typos, allowing me to easily make endless revisions until I have my text just as I want it. I need a program that will do the same thing for whatever graphics talents I possess. I need a Graphics Processor.

What's Out There to Work With?

The computer I'm currently using is a 130XE that has been Rambo-upgraded to 320K. My monitor is monochrome, but I have a fairly good color television within reach. I have several joysticks and paddle controllers, and my brother owns a KoalaPad touch tablet, which he loaned to me.

As for software, I had several programs to investigate. My brother had *Micro Illustrator*, the software that was packed with the KoalaPad, and *Ram-brandt 2.0* (Antic Publishing), which he purchased the same time as the Koala. I had something called *Micro Paint Artist* (a.k.a. *PAINT!*), a PD offering that had been sent to me years ago.

A scouring of the GENIE 8-bit Library produced two more programs. *Draw 7* (file #5513 & 5514) is shareware from David S. Beifeld. The program isn't dated, but the file was posted in 1991. The other was

Pixel Artist Deluxe (PAD) 1.3 (file #3434), a PD program from Art Horan. The posting date for this one was in 1988.

Partway through my investigation, the first issue of the new incarnation of Atari Classics arrived. There is an ad in that issue for a **Super Sketch Graphics Tablet** from More Than Games of Austin, Texas. Rather than being a touch tablet, this tablet has a movable arm with a pointer that you can use to trace drawings and photos. The cost, complete with software: \$12 postpaid. This sounded like just the thing for a non-artist like me. I spoke with Rick Detlefsen, owner of More Than Games, at the Atari 8-bit RTC on GENIE, and as he described the hardware and answered my questions, I became convinced of it. I ordered one and it arrived with little delay.

The Super Sketch was originally produced by Personal Peripherals, Inc (PPI) starting in 1984. Other models were produced for Commodore, Coleco, and TI99 computers. The tablet itself is about the size of a standard clipboard, with a working area around that of a half a sheet of paper. Besides the drawing arm, there are four push button switches and a paper clamp. From left to right, the switches are marked LIFT, SELECT, MENU, and LIFT again. A little investigation showed that the Super Sketch is compatible with the KoalaPad, with SELECT equivalent to the Koala left switch and the left-hand LIFT the same as the Koala right switch. The switches also correspond to the left, right, up, and down positions of a joystick. With the addition of another switch tied to the STRIG line of the connector, the Super Sketch could conceivably substitute for a joystick. Over all, the Super Sketch seems to be well made for a product of this type.

What Should a Graphics Processor Do?

I believe a graphics processor should manipulate pixels and lines to form pictures much the same way a word processor manipulates letters and words to form documents. Each of these programs does this, to a greater or lesser degree. The features that do this manipulation are generally called drawing tools. Some of the more common tools are:

PLOT/FREEHAND: All drawing programs have this one. Generally, you push and hold a button on the

controller to draw as you move the cursor and release it to move the cursor without drawing.

LINE: This helps you draw perfectly straight lines. The usual procedure is to move the cursor to one end of the prospective line, press a button, and move the cursor to the other end of the line. A temporary "rubber band" line will show on the screen. Move the cursor to precisely position the rubber band line and press the button again to make it permanent.

BOX/CIRCLE/ELLIPSE: Acts similar to LINE above. A reference point is defined (one corner for a box, the center for a circle or ellipse), then the cursor is moved away and a rubber band figure is shown, to be made permanent with another button press. Some programs will automatically fill these figures if you want.

FILL: This will fill any enclosed area with the current paint color or pattern.

PATTERN: A small area with pixels of two or more colors that can be used in a plot or fill operation. Typically used to create shading effects. Some programs allow the user to redefine the patterns.

BRUSH: Defines the shape of the line to be drawn. Can be a single point, multiple points, or a line. Some programs allow the user to redefine the brush shapes.

ZOOM: Magnifies a small area of the screen for detail work.

MIRROR: Create kaleidoscope-like effects. Helps when trying to draw symmetrical images.

BLOCK COPY: Similar to the same feature in a word processor. Lets you pick up a portion of the screen and reproduce it in other areas.

UNDO: Allows you to go back to an earlier stage in your drawing with a single keypress if you don't like what you just drew. Some programs will undo the undo.

RAYS: Acts similar to BOX/CIRCLE/ELLIPSE, creating a series of lines radiating from a single point.

AIRBRUSH: Paints with a more or less random pattern. Used for texturing.

SHIFT/ROTATE: Moves all or part of the screen area for centering or orientation.

The most basic of these features were common to all the programs. Of the more elaborate features, *Rambrandt* had the most and *PAINT!* had the least. See the accompanying chart for details.

Testing

I decided to try out each program with the same figure, a partially peeled ear of corn.

The basic shape of an ear of corn is that of an ellipse, somewhat flattened at the butt end. Curved lines running from somewhere in the middle of each side to the opposite butt "corner" would indicate the edges of the husk leaves remaining on the ear. The tips of the peeled leaves would show on either side of the ear.

A minimum of four colors would be necessary. The background, of course, would be one, probably white. The kernels would be another, a bright yellow. Another color would be needed for outlines, probably a light to medium green. Another, darker, green would be needed for the husk. This would be mixed with the other non-background colors in various patterns to produce husk leaves of various shades.

This seemed like a good test figure, one that would make use of many of the various drawing tools. Trying to draw this figure with some of the simpler programs would show if these tools are really so desirable.

Micro Paint Artist (PAINT!)

PAINT! is the simplest of these programs, so it should have the shortest learning curve. It seemed like the best place to start.

It wasn't. *PAINT!* is a bare-bones program, for joystick only. There is no provision for drawing curves other than freehand, and no cursor speed control. My joystick skills weren't up to the task of drawing a smooth curve with *PAINT!*, and I wasn't able to draw anything like an ear of corn with it. This program amply illustrates that the KISS philosophy (Keep It Simple, Stupid) can go too far.

Micro Illustrator

Since I didn't get far with the joystick, I thought I'd try the KoalaPad. Here I ran into another disappointment. My brother's KoalaPad is old, and has been mistreated along the way. As a consequence, it has a few spots that are less sensitive than others. Some are almost dead. When you try to draw a smooth freehand curve the cursor may take a sudden wild leap across the screen, leaving a jagged mess of a drawing. At best, that's annoying. At worst, well...

The Super Sketch wasn't much help, either. I soon found out that it isn't as compatible with the KoalaPad as I thought. The Super Sketch doesn't have any setting that corresponds to the KoalaPad with the stylus lifted, and that condition is vital to using *Micro Illustrator*. Perhaps yet another switch could be added to simulate this condition on the Super Sketch. It will take further study.

I WAS able to determine that, with a functioning KoalaPad, or a modified Super Sketch, I would be able to produce a passable drawing, although it would be more difficult than I would like. While *Micro Illustrator* has more tools than *PAINT!*, more yet would be helpful.

Super Sketch Software (Sketch)

I still thought the Super Sketch showed promise, if only it had the proper software. It was only logical to try the cartridge that came with it next. Since the

Super Sketch is designed for tracing over paper drawings, I pencilled out a rough outline to use as a guide, rather than trying to create an image on the screen from scratch.

This worked fairly well, and I was able to produce a usable drawing. I'm sure I'll get better with practice.

The trouble came when I saved the image to a disk file. Sketch files use a proprietary format not compatible with either of the more established *Micro Illustrator* or *Micro Painter* formats. This made the file unusable with *Billboard*, defeating the purpose of making the drawing in the first place. Rick Detlefsen tells me that a converter program is in the works, but isn't finished yet. When it is, I'm sure he'll make it widely available; but until then, Sketch will not be useful for my purposes.

Pixel Artist Deluxe 1.3 (PAD)

I was beginning to get discouraged by the time I got to *PAD*. Half of the programs were unusable for one reason or another, and I was preparing myself for the worst.

PAD restored my faith in the possibilities. It works with either joystick or touchpad, switching between them at the touch of a button. While it suffered with the same pad problem as *Micro Illustrator* (a hardware problem beyond its control), a "jitter filter" smoothed things out somewhat. A joystick cursor speed control slowed things down to where my feeble reaction time could cope, so I was able to create a drawing solely with the joystick. All drawing tools worked well, especially the unique "bend line" feature that helped me make curves with ease. Output files were in *Micro Painter* format, completely compatible with *Billboard*, and the program ran equally well with DOS 2.5 and MyDOS 4.5.

PAD requires 64K to run with all features. It will function with 48K, but the undo feature won't work.

The one drawback was a complete incompatibility with the Super Sketch. In fact, the program locked up when I plugged the Super Sketch in the KoalaPad's place. Putting that aside, though, *PAD* was acceptable. I put it on my new list of "definite maybes."

Draw 7

Draw 7 was another disappointment. At first glance, its lengthy documentation indicated a feature-packed program, but closer inspection showed it lacking in some important (to me) areas. The worst deficiency was the absence of multi-color fill patterns, which made shading very difficult.

The ellipse tool was another problem. With most of the programs, the orientation and relative thickness of the ellipse are controlled by the user. *Draw 7*

produces just one orientation and shape for an ellipse. All the user controls is the size and placement.

Draw 7's most unique features were the ability to record and play back the drawing procedure and to produce certain real-time special graphic effects. While these were interesting, they were useless for drawing vegetables.

Draw 7 is the biggest memory hog of the group, requiring the equivalent of a 130XE to run. As far as I can tell, the only use made of the extra memory is for temporary playback storage, a feature that could have been made optional.

Rambrandt 2.0

Obtaining a graphics processor wasn't my only goal when I started this project. This article was part of it, too. I delayed *Rambrandt* until last for a reason. *Rambrandt* is virtually unavailable to the vast majority of potential users. If it lived up to its ads in Antic, I feared the more available programs would pale by comparison. I wanted to compare *Rambrandt* to them, rather than the other way around.

Rambrandt has more features than any of the others, so it takes longer to learn. I haven't mastered it yet, and may not. Many of the features are unnecessary for the kind of basic drawing I want to do, much as many of those of a high-level word processor like *Paper Clip* or *Textpro* are for basic word processing. Still, it's nice to have them there, waiting for the time when basic features aren't enough.

Rambrandt was the only program of the group that happily accepted all of the controllers, although it would have benefitted from *PAD's* "jitter filter," especially in zoom mode. I used a combination of joystick and Super Sketch to produce my drawing. *Rambrandt's* Koala driver works just fine with the Super Sketch.

Rambrandt doesn't have a joystick speed control in the same sense as the other programs, where the response time of the cursor is changed. Instead, it has a special single step function that responds to the arrow keys. This is the best setup for control while in zoom mode, cleaning up all those little details. *Rambrandt* supplies a running display of the cursor coordinates in a command window, making precision positioning easy.

A look at the features chart shows that *Rambrandt* has 141 patterns available at any one time. This huge number comes from the program's ability to utilize the character maps from any 9-sector ATASCII font as patterns. I didn't begin to use this feature, but it really sounds intriguing.

Rambrandt's biggest failing is in its disk-handling facility. *Rambrandt* is written in Fig-Forth and uses a proprietary DOS, incompatible with other 8-bit DOS's. There are special modules for loading and saving pic-

tures with a DOS 2.0 disk, but they only work with single density. Those wishing to create picture file archives on higher-density disks or hard drives will require separate transfer steps to go from *Rambrandt* to archive and back again.

I found *Rambrandt* relatively easy to use. There's a lot to learn with it, but all that takes is a little time and effort. I put it on the list of "definite maybes" with *PAD 1.3*.

Rounding Things Up

My test is now finished, and the results are: 3 rejects, 2 maybes, and 1 future possibility. I'll be using the two "maybes" until something better comes along. My search was successful, and I should now be able to produce a few graphics for my business signs. With practice, my drawing should improve. I know my writing did the more I worked with word processors. Perhaps my skills will improve to the point where I can

make some decent icons using the *Print Shop Graphic Editors*.

I can also see that there is a lot of room for development in this area. We need more programs that draw in Graphics modes other than 15. We need a version of *Billboard* for color printers. A *Rambrandt*-style graphics processor that uses Jeff Potter's Colrview system would be marvelous, as would a *Billboard*-style color or gray-scale printer dump for it. These are just some of the possibilities.

Can you imagine scanning a photo into Colrview format, editing it with an 8-bit graphics processor and printing the results on a color printer blown up to any size you want? I can. Oh, it wouldn't be up to SVGA, MAC, Amiga, or ST production standards. But to do it with the 8-bit, to do things with 16-year old technology that its creators never dreamed possible, now THERE'S something worth working for.

Features	<i>PAINT!</i>	<i>MICRO ILLUSTRATOR</i>	<i>SUPER SKETCH</i>	<i>PAD1.3</i>	<i>DRAW7</i>	<i>RAMBRANDT</i>
Graphic Modes	1 (15)	1 (15)	1 (15)	1 (15)	draw1 (15) view4 (8, 9,10,11)	4 (9,10, 11,15)
Joystick	X	—	—	X	X	X
KoalaPad	—	X	—	X	—	X
SuperSketch	—	—	X	—	—	X
Memory	48K	48K	48K	48K	128K	48K
Freehand	X	X	X	X	X	X
Line	X	X	X	X	X	X
BendLine	—	—	—	X	—	—
Box	—	X	X	X	X	X
FilledBox	—	X	—	X	X	—
Circle	—	X	X	X	X	X
Fil'dCircle	—	X	—	X	X	—
Ellipse	—	—	—	X	X	X
Rays	—	X	X	X	X	—
Fill	X	X	X	X	X	X
ZoomMode	X	X	X	X	X	X
Undo	X	—	—	X	X	X
Brushes	1	9	16	6	1	5
User-Define Brushes	—	—	16	—	—	5
Patterns	6	12	16	16	—	141
User-Define Patterns	6	—	16	16	—	138
Airbrush	—	—	—	X	—	X
BlockCopy	—	—	X	—	X	X
Text	—	—	X	—	X	X
SpeedCntrl	—	—	—	X	X	X
Animation	—	—	—	—	—	X
Rotate	—	—	—	—	—	X
Shift	—	—	—	—	X	X
MirrorModes	—	1	3	—	3	3
PicFile Formats	MP	MI	Prop	MP, MI	MP, MI	Prop,MP,MI
Printer Dump	—	—	—	—	C.ITOH	C.ITOH OKIMATE Epson

The International ST/TT
Expert Programming Competition
THE ANSWERS
by Dave Small
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NOTE: This is different than most articles in *CN* in that this may be copied provided (please!) you copy it *intact*. I would appreciate translation to other languages very much, especially if you re-post the translated version to a BBS or networkter this competition.

* * *

Caution: This is for experts. Unlike many columns I write, this one is Not For Beginners. (I disagree! This is only for "experts" if you intend to make use of the information. All Atari users will benefit by reading the answers to these questions. -Joe W.)

* * *

Introduction: The Expert's Competitions

Last column, I presented a Programming Competition for ST Wizards anywhere. (I'll use "ST" to cover the whole product line, okay?) In the column were some pretty esoteric questions that only people who had met, and overcome them, could answer. I know those people are out there; I've met some of them in person, others via demo-disks, others via their programs. (I *still* like the sheer speed in the original *TEMPUS*, for instance.)

These are all "found out the hard way" questions. If you haven't programmed the ST, you may find them interesting; they're on the very edge of the ST envelope. If you're going to program the ST, you will find this knowledge extremely useful. . . this is one column worth tearing out and putting in your "Keepers" notebook. (If you don't have a notebook like that, start one.)

Questions labelled [OldTimers] relate to us who been programmin' the ST since 1985, and have used the tools available in 1985 ("the horror! the horror!") Similarly, other questions sometimes have a label on them to identify their topic.

Finally, in order to shorten this article, I have had to paraphrase the questions—it was 68k long first pass! I guess that's appropriate, though (*grin*).

1. [OldTimers]: What's wrong with conditional ASM using AS68?

After any conditional assembly, each branch (BRA or BRxx conditional) will be off by 2, then 4, then 6, bytes, meaning the CPU will jump *to the wrong place*, usually into the middle of an opcode. Each further BRA will be off 2 more bytes. I had WILD crashes from this in Spectre.

2. [OldTimers]: Why is it a bad idea to have two labels, with no opcode, in AS68? Like this:

```
;-----
VIDEOROUTINE
RELOOP
    (routine code)
    BRA RELOOP
; end of routine
;-----
```

Same as #1; again, every Branch instruction below two labels, with no opcode in it, will go off 2, 4, 6 . . . increasingly off. (This led to me putting a NOP on EVERY LABEL in the Mac Emulator, something that had to be pulled later—it was taking up too much room.)

I have run into this problem with other assemblers; sometimes it is called a "synchronization error." I don't know why it should be such a popular error, but look out for it!

3. [OldTimers]: What GHASTLY thing will happen if you assemble an assembly language file named, oh, "DSMALL.S" using AS68, like this:

AS68 -1 DSMALL

Why, nice ol' AS68 will write the output ON TOP OF THE SOURCE CODE! In other words, your program's source code (what you wrote, the assembly language & comments) would be overwritten by the output and destroyed. This bug bit me so often Dan Moore whipped me up a batch file to make SURE the filename had a ".S" on it; otherwise, it aborted. You'll find a reference to this in the "Neil Young" section of the Spectre manual—when the code assembled first time, no errors, I was sure I had zapped the source code AGAIN from this error.

4. [OldTimers] What happens if you try to LO68/RELMOD a file that doesn't exist? For instance, as part of a batch file to assemble, link, and RELMOD (change from CP/M-68K to TOS format) a file.

Sweet, kind ol' LO68/RELMOD would fill up YOUR ENTIRE DISK with a file that was . . . garbage. It would only stop when you RESET or it ran out of free space on the disk. Of course, hitting RESET during a filewrite practically guarantees directory damage (in this case, "lost clusters"—as though something swallowed part of your disk).

Naturally, recovering the free space from a file that went bad was mighty hard in 1985 . . . there were no tools! (Dan Moore wrote a CHKDSK that could recover the taken-up sectors; before that, I generally copied to another partition, "zeroed" the loused-up one, and copied back. Make no mistake; many of the articles we did together were "sheer necessity stuff." For example, PARTCOPY was for backups; TWISTER was to speed up floppies 2 times; MEG A MINUTE was a fast floppy backup program.

Nowadays, we have much better tools to recover disk space, and DEVPAK, as well as other assemblers/linkers, that do not pull this.

5. [Easy Question] Why do I not use AS68 nor LO68/RELMOD any more? (HINT: See #1-4)

I'd like to strangle whoever wrote them. Nonetheless, Spectre was built by them for a long, long time. ("I think it's gonna be a long, long time."—Elton John)

Adding insult to injury was that AS68, then LO68/RELMOD was SLOW! We're talking many minutes per program "built" here. We changed to DEVPAK, which was FAR faster, and have been, well, overjoyed with it.

6. [Hard Assembly Question] (See contest entry for data in address and data registers; here are the relevant ones. The others are smokescreen.)

supervisorA7 = \$1235 Status Reg. = \$2307

PC = \$5000 (and is in a legal program, etc.)

Supervisor mode (e.g., SSP & current A7=\$1235).

You perform a multiply instruction using D0 and D1. WHY, exactly, do you get three instant bombs (yes, 3!)? (Remember, we're at IPL 7, so interrupts are not the problem).

Here's something Motorola didn't tell you, which took me the In-Circuit Emulator to find: MULTIPLY and DIVIDE USE THE STACK as temporary "scratch space." You'll note A7 above is odd-aligned; well, the 68000 cannot use an odd-aligned stack, as it is a word (2-byte) oriented processor. So, technically, you get 3 bombs because this is an "address error" (attempt to do a word-long access on an odd-aligned address). (2 bombs is a bus error; 4 bombs is illegal instruction. In the course of the Multiply, it tries a word access to the stack, which is odd aligned; bang, 3 bombs!)

Find THAT in the (fracklesnitz) 68000 manual!

Please remember to always have a stack "up" when using multiply and divide.

You know . . . I also wonder what the heck programmers do with a 68000 in a system with no RAM . . . but I'm sure they don't multiply and divide.

7. [Hard Assembly Question] Assume you shut down RAM for a time (by writing to the Atari Memory Controller, the MCU, formerly called MMU until that became confusing with the 68030's MMU). Interrupts are off. Now, do a division. Will it work? Why?

Nope, it will fail. Divide needs the stack for scratchpad RAM, too. With the MCU shut down . . . *thud*. You'll probably double-bus error (the CPU will bus error trying to use scratchpad RAM that doesn't work, then will double-bus error trying to write an "I've Crashed!" stackframe to RAM, which it can't do. Double bus errors are as bad a crash as it gets in the 680x0 world.)

Gee, do #6 and #7 give any of you copy-protection people devious ideas? They should. For example, do a multiply, with the stack pointing at some critical location. Put this code in an obvious copy-protect module that people will be tempted to bypass. The "critical location" will not be modified. Then, if it isn't modified, Boom! The "cracker" will not know WHY that location would be modified—"after all, you're not using the stack. . ."

There are much more clever ways to use this knowledge, of course. Go for it!

8. [Hard Assembly Question] How, exactly, can you generate a "spurious interrupt?" NOTE: Atari assures me it is "impossible."

This one prevented Spectre sound from working for a LONG time. Again, a hardware I.C.E. was needed to solve it. Remember, I was supposed to rule out the possibility of a spurious interrupt. . . *sigh*.

To spurious interrupt your machine, run a high speed MFP-68901 chip timer interrupt (11 Khz, or 11,000/sec, is plenty). Use it to play digital sound via stuffing the sound chip. (There is a good example assembly code in *ST-REPLAY* for this). This pretty well saturates the Atari CPU—at 8 Mhz, you're just about to smother it with interrupts. (In other words, the 68000 is just barely completing one interrupt when another happens.)

NOW, let vertical blank interrupts ("VBL"s) happen. (They are used in Atari and Spectre modes to do routine, "heartbeat" tasks; for example, they update the mouse pointer and time ticker.) So, the 68000 CPU is running (effectively) Very Slowly,

handling that VBL. In another 60th second, another VBL interrupt will come in (every 1/60th or 1/70th second, depending on your monitor; color is 60, mono is 70.). The second VBL will happen before the machine has, more-or-less, "acknowledged" the first VBL. Also, it will upset the processing of those 11 Khz interrupts hammering the CPU's coffin shut.

All of this results in the GLUE chip, which is supposed to worry about this stuff, dropping back five to punt, and going quietly to sleep.

The result? The CPU will get an interrupt request, say, "Okay, WHO interrupted me NOW?" and because everything is so tied up, with the 68901 MFP interrupt controller getting bombarded by 11 Khz interrupt requests, that the MFP *will not answer the 68000(!)* Result: *lots of bombs*, and a "spurious interrupt." A "spurious interrupt" literally means the 68000 was told to interrupt by a chip like the 68901 MFP. It said, okay, what interrupt? and was never answered. After a certain amount of time, the 68000 punts, assumes a hardware bug, and does a spurious interrupt, to let the user know Something Is Wrong. (This shows you Motorola was on the ball. Instead of just crashing mysteriously, the 68000 tells you a spurious interrupt happened, which greatly narrows the field of possible causes).

The (hilarious) "fix" to this I found out for Spectre is ONE LINE OF CODE. Just put a "pointer" to an RTE (Return from Exception) instruction (it's effectively return from interrupt) in the "Spurious Interrupt Vector" location. Just let it happen! Don't even sweat it.

First time I tried this, *sound worked on Spectre*. I run it off an interrupt, 11,000 times a second. This is why sound slows down Spectre.

I literally never touched this code again. Problem solved; been there, done that.

Little known embarrassing secret: My sound "test program," which generated repeated test sounds, was called "MacPlayMate." It, err, makes repeated sounds.

Now look, I needed something that was constantly changing sounds so I could tell if I was keeping up. Sandy, I promise!, I was looking at the debug terminal and the Zax I.C.E. terminal, NOT THE PICTURES!

And you know . . .

. . . Believe me, it is real difficult to have some(thing) saying, "Ooooooh, Aaaaaah" over and over and over while you are debugging!

9. [Hard Floppy Disk Controller/Disk Drive Question] How can you consistently access tracks -1, -2, and -3, to either implement copy protection or just store data?

The thing that normally halts the FDC, Floppy Disk Controller, from stepping further inwards is the "Track 00" wire in the floppy disk cable. The floppy drive makes this wire go "TRUE" when you hit track 0, and the FDC halts in its tracks.

The solution? Just cut the TRK00 wire in the FDC cable! (Better, put a switch on it, so you can be sure of TRK00 from time to time. And you should really put a +5 pullup, say, 2.2K ohm, on it, to be certain it is not telling the FDC it's on track 0 accidentally.

There IS a software solution I know of which involves starting up a step, then de-selecting the drive at EXACT timing (to the

nanoseconds), so the TRK00 line does not go true (a de-selected drive cannot TRUE the line). The STEP procedure checks TRK00, it's showing non-TRK 00, then you RE-select the drive in time for the actual step. This is NOT trivial—get a fast oscilloscope if you want to play with this. Really, I think there are some things that wire cutters are the best for!

By the way: Apple II's had no track 00 sensor; that's why they stepped inwards 40+ times, and "buzzed" when they hit track 00, on startup. You always wondered why Apple II's "buzzed" on powerup; now you know.

10. [Heavy Floppy Disk Controller/Disk Question] *Why is it a good idea to ALWAYS step outwards five times before doing a RESTORE (seek to TRACK 0)? Note this is done on the ATR-8000 8-bit Atari machine (a fine, fine, reliable CP/M machine, too.)*

Because the disk head sometimes gets stuck behind the track 00 sensor, which causes the TRK00 wire to show "false" (hey, it's not on Track 0, it's on track -2!) and you will NEVER get to track 00 by stepping "further in!" I see this all the time on Atari drives after the drives have been bounced around by airlines, and are on track "minus something." I learned this trick from Russell Smith and the ATR-8000; 8-inch drives were particularly prone to this. Nasty!

Russell taught me something else. He believed strongly in the apprentice system—that "programming ought to be learned over the shoulder of a master." I agree, totally. I think example code, especially rough stuff like this, is the best way to learn. That's why we ALWAYS gave away the SOURCE CODE to our START programs. (They've ended up on several public domain collections, despite copyright.)

11. [Heavy Assembly/C Question] *What is the problem between the Atari and Mac concerning locations \$100-\$13F? Why does this spell absolute disaster for a Mac Emulator on the ST hardware?*

Locations \$100-\$13F are, in effect, USED BY THE ST HARDWARE. They are completely essential! They are the "interrupt vectors," or, in English, the *location* or *address* where the CPU jumps to on a particular interrupt, as controlled by the MFP 68901 "interrupt controller" chip in the ST. (For example, when you receive a character through the serial port, the MFP looks up the address to handle things in this table; same thing for a mouse movement. There are 16 interrupts handled through the MFP; hence 16 locations in the table.)

Alas, the Mac also used these locations (EXTENSIVELY; almost every Mac program reads them) as "globals," or variables that every Mac program used. Hence, I had to give them to the Mac . . . trouble is, that would crash the ST, since they would no longer be addresses, but various Mac trivia. When you received a character and the MFP looked in its table at \$100-\$13F, it would get some wild address, and crash.

This was the end of the Mac-ST project . . . until . . .

12. [Heavy Hardware Question] *When I solved it, it was the last "big" problem in implementing a Mac emulator. I literally woke up with the solution at 3 AM. Two months later, Mac mode ran. So: How'd I solve this problem?*

I read many "exciting" books in 1985, like *everything* about the 68000 and other chips in the ST. One day, a real thriller, "The 68901 MFP 'Multi-Function Peripheral' Interrupt Controller /

Timer / Serial Chip," came from Motorola. (Are we talking major yawn?) I read through it, thinking, yeah, yeah, *yawn*, so what program serial ports.

But one page must have sunk in as I flipped through the manual. I woke up at 3 A.M. next morning and flipped the pages to something my brain was yelling at me to see. And, incredibly, there it was, the last unsolvable problem, solved. I felt a buzz throughout me. I COULD DO IT—I really could write a program that would run Mac software on the ST. This was the last "impossible" problem—solved.

Interrupt Vector Base.

The MFP68901 has a VERY little known "register," or chip location, you can write to, *which sets the starting "base" of the 16 interrupt vectors table. Now sure, currently, it was at \$100, colliding with the Mac Globals, BUT NOW I COULD MOVE IT!*

Well, within limits. But, incredibly, there was an open place to put 16 .Longs, (64 bytes), just next door.

Locations \$C0 \$FF, right under \$100-\$13F, are not used by *anything* Mac nor Atari. So . . . well, I just moved the MFP's needed table to there. *And it worked.* In all the time since, a very few programs have ever stepped on these locations, and they should not have been doing that in the first place.

You know . . . I can still remember reading the description on that register, and thinking, "My Heavens, I really can do this now. . ." I didn't get back to sleep that night.

13. [Light Assembly Question] *What does Test and Set (TAS opcode) do on an Atari ST? Why? Should it? (TAS is traditionally used to implement "kernal" operations on multi-tasking, multi-CPU machines).*

TAS crashes the ST nicely. This is annoying, since one popular 68000 teaching book uses TAS to halt a program.

Since TAS is used by multi-processor systems (more than one 68000, for instance), it's not really important that the ST handle this instruction. It's one of those, "who cares?" things. ST's are not designed for multiple processors, so it's a moot question.

14. [Extremely Heavy Assembly Question] *Assume you are working with a Mac program that writes to location 0 via a Nil Pointer. On the ST, that's writing to ROM, and you bus-error and 2-bomb crash. On the Mac, well, the Mac is wired to NEVER bus error, no matter what. (The later Mac II, and later machines, bus error just fine.)*

How can you then RECOVER from the bus error, given that Motorola's 68000 books say you can't, and keep going? (Motorola says you need a 68010 chip to recover, and to implement Virtual Memory, as the 68000 buserr stack frame doesn't have enough data.)

Assume that data written to a Nil pointer is unimportant, because the program should not be doing that anyway!—the data is unrecoverable.

This one's secret. Don't tell anyone. This is a key underpinning of the Spectre GCR, the zerostore handler.

The MC68000 chip CAN recover from a bus error. The only instructions that cannot be recovered from are the bit-test instructions, because they don't crash "right" (!) in terms of the IW. Bit tests are not a common crash, and heck, I found a way to handle them, more or less, too.

It goes like this. You may not get as much crash information from this 2-bomb as a 68010 chip, but you get a look. Look it over. I did.

If you look at the crash data on the stack, you'll find "IW," or the "Instruction Word." All 68000 opcodes take 16 bits, or 1 word, for the basic opcode; sometimes more data is needed in following words. But that one word describes the instruction completely. Alas, the Program Counter, or where you are in the program, is fouled up; it's pointing between 4 and 10 bytes PAST the 68000 opcode that crashed it, because the 68000 is "pre-fetching" the next opcode.

Well, we know that the programmer has no business writing to location 0, so we do something to SKIP the instruction that killed the ST.

So. Point the bus-error handler at code that does this.

1) Start at the current PC.

2) Go BACKWARDS, scanning.

3) FIND the Instruction Word (in IW) opcode in the program! It's there, alright (except in bit-tests, as mentioned—THEY put the next opcode's IW up).

Well, now it gets tricky. I dreaded writing this part, and it took much debugging for obscure 68000 instructions.

DISASSEMBLE the IW's instruction, find out how long it is. Remember, we are trying to skip it. 68000 instructions can be from one word to many words long, depending on what they are and data included in them. What you want to find is the NEXT INSTRUCTION'S START, which you can only do by *figuring the current instruction's length*. Well, do that. When you find out the next instruction's location, set up a standard looking "exception" or "interrupt" stack "frame," which is how the 68000 stores what it was doing before an interrupt, so it can recover, kind of what would be there if you had just sorta had a friendly normal interrupt instead of a crash, setup the "next instruction" return-to PC to be the next instruction to run, copy over the SR and such, and do a Return from Exception (RTE).

Believe it or not, the 68000 doesn't care that it just double-bombed. It says, "Gee, I must have had an interrupt, and it's time to get back to work at this place." And . . . Bing! The Spectre comes bouncing right back up!

You have just SKIPPED OVER the instruction that crashed you. I couldn't believe it the first time this worked. The Motorola book says you have to get a MC68010 chip to do this (handle bus errors). Nope.

Small's Laws, #172: Read ALL you can, but *don't believe all you read* until you have tested it yourself, if you want to seriously be a hacker. Look where the 68901 manual got me!

(Example: What CDC or UNIX manuals say will happen if you try to do some things that aren't, well, authorized is VERY different from what REALLY happens. I know these two examples from personal experience. Go test it yourself. You'd be amazed at the gap between the technical documentation writers and the systems programmers . . .

Another way to put it is, "Test the perimeter fence systematically," (from "Jurassic Park.")

Now, the more experienced programmers are saying, wait a minute, that instruction was in there for a reason. True. But it was a Nil pointer (a pointer to location 0 in memory), which

means the Mac programmer had *blown it anyway*, and was not pointing to a data structure or something. *No Mac program should do this*. If a Mac program continues to run with a zero-store, it's a miracle anyway, Mac or ST, and I don't worry about it.

We did, eventually, run into "zero-read" problems, where a program would (illegally) zero-store, then expect to read back what was there. This is hard to implement on the ST, where location 0 is ROM—unchangeable. We found a way.

After all the zero-stores I've seen, I am AMAZED Mac programs run. But, then again . . . Macs bomb mysteriously from time to time, don't they?

15. [Funny Assembly Question] Does Atari's TOS ever access location 0 because of a Nil Pointer?

Once, I asked the I.C.E. to "trap" and report all accesses to location 0. Then I ran TOS. Every time I pulled down a menu, opened a window, double-clicked a program, blew my nose . . . wham, reads from location 0. Nil pointers. Naturally, they'd gotten rid of stores to location 0, because those caused a 2-bomb bus error crash, but not the reads, which don't cause a crash. . . well, immediately anyway.

16. [TT User Question; Assembly/C Answer] Why does having TT RAM (or equivalent) in the TT (or equivalent 68030 accelerated) machine end up usually accelerating the TT about 11% (depends a little on what you're doing), provided the RAM is there AT STARTUP?

IF the TT RAM (or, SST RAM, *grin*) is detected at startup, portions (NOT ALL!) of TOS and, most critically, THE SUPERVISOR STACK, are moved to TT RAM, by the startup code. TT RAM runs faster than ROM chips. What is significant is because the supervisor stack *is used on every interrupt* (including all keyboard entries, mouse moves, 1/60th second VBL's, 1/200th sec GEM timer interrupts, which happen *all the time*), and it is now located physically in faster RAM, your machine and programs, generally, run around 11% faster, doing, well, most things.

By the way, hear and believe: IT IS TOTALLY UN-COOL to copy the ENTIRE TOS ROMS into TT RAM and then MMU-Map TT-RAM "over" the chips to try to speed up TOS. I've seen 10 programs, at least, which do this (nuts!). Listen. Get rid of them. TOS *relies on running at a certain speed to work*. Those ROMs force the right speed. John Townsend of Atari specifically mentioned this online, and he was one of two primary TOS 3/4 programmers. Do Not Do This.

17. [Extremely Heavy Hardware/Software Question] You need to start up a 68030 with the first 68030 compatible TOS, TOS 1.62, to begin to debug a 68030 board. The TOS chips are plugged in through the Mega ST bus connector and a PAL address decoder (thus allowing all 256K of ROM to be accessed) and are properly mapped at \$00E00000 (by the way, the 24-bit address has nothing to do with this question!) The old TOS 1.4 chips are removed.

Trouble is, you're doing this on a Mega-ST, and TOS 1.62 is for STE machines, with their added video/sound registers. When you try to start up, you crash, as TOS initializes video/sound registers that don't exist on a Mega-ST and bus-errors out, since those locations don't exist on the Mega-ST.

Without copying/modifying those TOS ROMs, (like, NOP'ing out the inconvenient writes to Mega-Ste only stuff) and without

some big fancy PAL disabling certain ROM addresses, how can you get around this stuff in TOS startup and in the VBLANK (vertical blank) code, and stay legal. (I'm rather touchy about staying legal with ROMs. I think you can imagine why! grin)

In other words, I'm asking you how to run ROM code and change the path of execution in non-writeable, "firm" ware. We did this to show a 68030 running on an ST at a World of Atari show, if memory serves. Unmodified TOS 1.62. NOTE: This is an Extremely valuable technique to know. It is probably patentable.

This is a REALLY slick technique. Now look, it *could* be misused to create a "copy protection cracker" program, and that's all I'm going to say on THAT point. (I was hesitant to include it, but, I have been asked how we made TOS 1.62 run on a Mega-ST repeatedly).

Do this. On powerup, the Atari checks for a cartridge "signature." If it finds it, it jumps to the cartridge. That's your "foot in the door."

Now, in your cartridge ROM, put the CPU into "trace" mode. This makes the 68030 execute one instruction, generate a "trace interrupt" (and tell you where it is and what it's up to), and jump to your cartridge. Well. Now start it "tracing" through the Atari ROMs *as though it was a normal machine startup*.

Every Atari ROM instruction, it returns to you, telling you the next location it's going to single-step. Now, just have a lookup table of "dangerous locations" you don't want the 68030 CPU to use! For instance, if the next instruction is going to be one of those annoying writes to the low-word of video only found on Mega-STe's, just SKIP over it. (modify the stack so it returns to PAST the "crasher" instruction.) Thus, your table has a list of 1) annoying locations and 2) specific code that handles that location, since some require special handling. Most just require skipping.

You'll find, because of trace overhead, the speed is so slow you'll have to write a clear-screen and clear-memory routine to replace those in the Atari ROMs. That's the result of doing a trace. But hang in there; soon, you won't have to trace, once you get past startup.

You'll also find that the vertical blank code has to be changed; it writes to the Mega-STe only registers. Well, that's an easy fix. Just put in a *new VBL handler*, and delete (NOP out) the Mega-STe specific stuff.

Once you've cleared all the "minefields" in the TOS startup code, you're done. Turn OFF trace mode, return to high speed mode, and let the Atari TOS run at normal speed.

Jim Allen wrote of this, "Dave Small came up with this incredible hack to make TOS 1.62 run . . . some day the world will know . . ." when we presented a 68030, running TOS 1.62, to the show. It's nice when people write something like that. A little hard on my modesty, true . . .

18. [Medium Hardware Question] What *usually* happens if you directly switch on video? In other words, do a MOVE right into the hardware location that has the display mode (low, medium, high rez) to turn the screen on.

You get a video display of 16 dots (one word) on, then 16 dots off (black), over and over across the screen. It looks like you're viewing the desktop through vertical prison bars on the screen.

19. [Medium Hardware Question] What's probably going wrong in what happens in question 18?

What you've done, by not kicking on the video chip with the *exact right timing* (it has to be done in VBL, when the video chip is NOT generating a screen; look at the Atari XBIOS code for changing ST resolutions for the precise code), is to mess up the "fetch-video-word, fetch-CPU-word, fetch-video-word, fetch-CPU-word" timing that keeps the ST running. ST memory runs at 16 Mhz. Video gets every other cycle; the CPU gets the other half of the cycles. The video word "fetch" must occur, just right, to stuff into the ST video chip (so video can start outputting it, one dot at a time, 16 dots, or do it differently for color). By not being timed/initialized properly, the ST video chip has trash to work with, so it generates 16 black dots (which mean it reads a \$FFFF, or all 1's, which usually means a "miss" memory access; "misses" return all 1's.) Boy, would I like to know how the hardware-Overscan people in Germany solved this. They are wizards.

20. [Medium Hardware Question] What does "ST" stand for officially, and what does it have to do with question 18?

"Sixteen-ThirtyTwo." The 68000 processor has a 16-bit data bus (meaning, 16 wires carrying data to/from the chip), so it is "word," or "16-bit," oriented, but also had an *internal* 32-bit, well, everything . . . address and data registers, program counter, and so forth. It's just a 32-bit processor with a halfsize data path. (In comparison, the 68030 has 32/32 bit everything; alas, it's a bit difficult to connect a 68030 to the ST because of this, and because of the routine use of undocumented, incredibly forgiving aspects of the 68000 that were not carried over to the 68030, it was much rougher.)

Because the data path is 16 bits on the ST, the vertical bars are 16 bits wide, and the desktop behind them is 16 dots wide. That's the relationship.

I, personally, think there is much to be gained in fiddling with this with exact timing. For example, a German group (I *think*) discovered that flipping resolution at the precise right time killed horizontal and vertical blanking—e.g., the "borders" on the ST. Data could be plotted there, and is, on countless demos. Also, note that the various painting programs that displayed more than 16 colors did it by simply stuffing new colors in *as the display was plotted*; each line had a new color-stuffer routine. It was very slick. (Spectrum 512 comes to mind, but there are others.)

Little Known: The original, "codename" name of the Atari ST was the "RBP"—"Rock Bottom Price." You'll find that in the earliest BIOS/XBIOS listings, and in early documentation. The ST is a miracle in how *few* chips are there, and what was done with them. (Look for comments by Jim Tittsler or Landon Dyer, especially.)

21. [Medium Software Question] What's the solution to 18? How can you kick video on yourself and make it work 100% of the time?

Time to get your feet wet. Write a short program to change resolution, using the XBIOS call. Trace it. (This is tricky, since you're usually switching user → supervisor mode, but just put a "trap" or "go until" on the XBIOS handler. No problem.)

So, go *look* how Atari does it, in either the initial turn-on code, or the set-new-resolution code. (Let me point out a COMMENTED VERSION is in the developer kit listings! You don't even

have to disassemble it, although the experience is valuable). You're still going to need to look, but essentially, they wait until a specific instant, then hit the video chip to change resolutions. That specific instant is vital. Sure, it's easiest to just use the XBIOS operating system call to change the resolution, but if you absolutely *must* (I mean, yes, there ARE times you cannot call the XBIOS, like when it has been systematically blitzed—see Spectre) then use working code as an example. Don't spend a hundred years puzzling it out—go look.

22. [Light Hardware Question] *Assume you are running on a TT. The cartridge you have in there (let's stay away from Spectre so you don't think it's only Spectre related, say, some video digitizer cartridge, well, the cartridge suddenly fails with a gruesome direct short circuit. You, sensibly, turn the TT off and remove the cartridge. You replace it with a new cartridge. The TT has (at best) extreme difficulty using the new cartridge, to say the least! (It probably won't work at all.)*

ASSUME that the cartridge's ROM-decode, read, PAL logic, and all that stuff, was not damaged. What's wrong? And why is this something EVERY TT owner should know? (I believe it applies to Mega-STE's, as well).

This one really ticks me off. Atari didn't tell a whole lot of people THAT THERE IS A FUSE ON THE CARTRIDGE PORT OF THE TT. It's on the +5 Volt DC power supply to the cartridge. It is located on the TT circuit board about 1/2 inch (1 cm) from the cartridge port's PC board plug-in, towards the back of the TT.

It does NOT look like a fuse, either!

Sigh—If you get a cartridge in a little slaunch-ways, it will blow the fuse, and the +5 power for the cartridge port is cut off FOREVER unless you know about the fuse and are proficient enough with a soldering iron to fix it. (There aren't fuses on the ST.) Worse, the fuse physically LOOKS like a little resistor. It is rather hard to tell it has blown without a meter.

We've tried to "Spread the Word" about this little sucker, because every cartridge you plug in there will fail once this fuse pops, and because, in my opinion (having dead-shortened numerous ST/TT machines and never killed one), there is no need for it. Maybe they did it to the TT because of the hard disk in there, as a protective measure? I'll never know.

This fuse has caused Gadgets all sorts of trouble with TT's, and is surprisingly hard to diagnose, since most cartridges don't have LED's or something on them to let you know there's power. That's because they were designed with the assumption there would always be power, since the ST is that way. So, first thing we do, when we get a call about a TT and a GCR that don't get along, is ask, "Have you checked the fuse?" And, typically, we get back, "What fuse?"

I have been known, by the way, to *accidentally* solder a "slow-blow" fuse across the circuit board fuse, since most shorts are very transient and won't pop that type of fuse. You could replace the fuse with, say, a 2 amp fuse and even a Fuse Socket so it's easily replaceable. 2 amps should be *ample* . . . a truly horrid pun. Sorry 'bout that.

23. [Heavy Hardware Question] *What did Atari NOT keep constant between the ST and TT cartridge timing? Why does this foul up cartridges?*

SIGH! Wow, this was a hard one. Especially mixed in with the TT fuse issue, which confuses everything, and which few people know about.

By the way, depending on which PAL set you have in your TT, this may, or may not, be true. [A PAL is a programmable logic chip that rolls many chips into one, something like an EPROM but working on logic circuits and timing, not at high-level programming levels.] My TT's PAL set emulates an ST's timing almost *perfectly* and Spectre GCR works fine, which is why GCR's got out there amongst TT's, and failed. Those TT's had different timing. We, literally, first saw this problem "hands on" when we went to Germany for the Dusseldorf show. Until then, we were puzzling over fuses, PAL sets, and so forth.

When the TT goes to the cartridge for a read, it puts the address on the "bus" (all the address wires), and pulls the "cartridge strobe" wire to "true" (meaning, "here's the address, buddy") In this case, 0 volts means true; this is common. Thus, we went from +5 volts to 0 volts; this is called a "FALLING EDGE" for obvious reasons. This action means, "Get Started Reading THIS address!" to the cartridge.

Well, this is fine for read-only type cartridges, but "Houston, We Got A Problem" for Spectre GCR. We have to WRITE to the cartridge.

Since we must SEND data to the Spectre (say, some byte to be written to the disk!), and you CANNOT write to the cartridge address space (bus error if you try), only read, what we do is make an address *range* "magic"; when you read a certain address range, the lowest part of that address is "latched," or held, by the GCR cartridge, and (typically) plopped onto the disk. (There are other address ranges for programming the GCR.)

Mind you, we are not doing the typical thing: putting an address out, letting a ROM-only cartridge see it, get data at that address, and put it on the data lines. We are sending data by using part of the address as data lines. However, dozens of cartridges, from EPROM burners to network carts, use the same idea.

The Spectre GCR, and some other cartridges, commonly "latch" this address data on the RISING EDGE of the strobe (when the strobe bounces back up to 5 volts, where it lives 99% of its life.) This is near the end of the CPU "cycle." Heck, we'd have to be crazy to latch on the falling edge; the address lines are still "settling" at that point, according to our fast oscilloscope. There's lots of time for them to stabilize during the "cycle" time.

Alas, we relied on the address bus remaining stable AFTER the rising edge (sigh, for very few ns. indeed). On the ST, it stays stable a LONG time. (It can't miss; I mean, it's an 8 Mhz processor! That means 125 ns. cycles). On the TT, it *does not*. The address lines "decay" *incredibly* fast. If you have a TT RAM board also loading down the address bus, it degrades more quickly, which explains another early, puzzling fact about this bug: a TT RAM board made it worse.

One thing I have always wondered. Did the last minute change from 16 to 32 Mhz on the TT 68030 cause this, or the strange timing I've clocked on the hardware? Are we running 62.5 ns cycles, (16 Mhz) instead of 125 (8 Mhz)? If so, that would explain a very great deal.

Our solution is not real clever, but it works. We say, "go" starting on the FALLING EDGE of the cartridge "strobe," "wait" a little while until we're in the middle of the 125 ns. cycle, then use the address that's there. We figure that's as stable as the address is going to get, and it's going to get worse shortly. We don't rely on the rising edge whatsoever.

This fixes *MOST* TT's, but, alas, not all. Since the ST is running slow cycles, it works there, too, so it's compatible across machines. The address lines still have some "burbles" on them, and you only have between 0 and 0.8 volts tolerance to burble, which is not much at all. A little ground bounce, a cold solder joint on an address pin . . . whammo.

Just for your reference, in terms of computers:

Digital "0" is 0 to 0.8 volts,

"voodoo" is 0.8 to 2.0 volts, [neither 0 nor 1]

Digital "1" is 2.0 volts to 5.0 volts.

You *must* stay out of the "voodoo" or "transition" zone. You can see that there is MUCH less room for error on the low side (0.8 V) than on the high side (3.0 V). A little bit of "burbles" on the address lines of a TT will render a Spectre, and a lot of other cartridges, inoperative. I suspect this is the problem on the few TT's we can't get a Spectre to work on.

(I *did* say this was a "heavy hardware question"!)

24. [Heavy Software/Hardware Question] *Many Atari chips cannot be accessed too quickly over and over again without fouling them up. So, you must slow down fast machines (like TT's), typically using a "delay loop" that does something to bog down the machine for long enough.*

What's the documented, sorta "official" way of assuring a "slow," 125 nanosecond or "8 Mhz" cycle to provide an enforced slowdown for the SCC and disk chips on a faster machine, like an accelerator or TT?

Doing this opcode:

```
TST.B    MFP          ; MFP is the 68981 chip
```

is SUPPOSED to generate a slow cycle on the TT, same speed as an ST. Any "hardware location" write (including cartridge) is supposed to do this.

Don't believe it for a second.

Remember, I said, to be a hacker, read everything, but don't believe it--TEST it. I tested it.

25. [Heavy Hardware Question] *What happens when you try that assured, guaranteed 8 Mhz cycle technique on a TT machine?*

You crash. (At least, in my case). What follows is my opinion, based on tests I've run, especially on the rather TT-specific areas of Spectre. There is a myth that on a TT, doing a TST.B MFP (e.g., doing a bit-test on the MFP chip) will "absolutely force" an 8 Mhz, 125-ns cycle, and, thus, you can implement timing loops with it that will run as fast on an ST or a TT (very important in floppy and hard disk work, and in SCSI, I'll tell you!) This applies to any "hardware location" in the \$Fx xxxx range (cartridge, etc). Thus, this code will run just about exactly as fast on the TT as the ST:

```
;--- Do one write to a "slow" chip that
```

```
;   needs some delay.
```

```
    move.b    #12,SCC    ; write to some slow hardware
                        ; that needs a delay.
```

```
;--- now delay
    move.l    #1000,d0    ; put 1000 in d0. This is our
                        ; repeat counter, tuned to 2.2
                        ; microsec for SCC chip
;=== CRITICAL "SLOW" DELAY LOOP, must be 2.2
;   microseconds or slower
delay:
    tst.b     MFP          ; "force 8 Mhz cycle, TT or ST"
    dbf d0,delay          ; d0=d0-1; if d0 goes negative,
                        ; don't branch.
;=== END CRITICAL "SLOW" DELAY LOOP
;--- Now do second write to "slow" chip that
;   needs delay.
    move.b    #$FE, SCC    ; write to slow hardware
; and so forth.
```

Thus, even though we're buzzing along at 32 Mhz on a TT or 8 Mhz on an ST, when we do the tst.b MFP instruction a thousand times, each time, we have to "bog down" to 8 Mhz. So, the ST and TT run roughly the same speed.

This is wrong. Get your own stopwatch and time the ST and TT doing the same loop. I did. I think you'll find the TT system bus, regardless of cache on/off, runs at 16 Mhz, including the MFP test. (That's what I got when I tested it.)

I do know *for a fact* that disk code which failed on a TT, in delay loops, bounces back to working if you just *DOUBLE* the number of MFP "hits" if you're on a TT. It sure acts like the TT is running twice as fast as the ST. If you're writing many types of software, you need to know this.

26. [Heavy Software/Hardware Question] *What exactly causes keyboard and mouse lockups when you run code that locks out interrupts temporarily on the ST? (e.g., IPL 7). What is the ESSENTIAL thing wrong? What's a fairly good way of fixing this in your mouse and keyboard handler? (I call mine "Quick-Mouse," by the way.)*

If you look at the developer kit schematics, you'll see the keyboard is a SERIAL (like, modem) device that feeds into a 6850 serial chip. The keyboard sends key-down, key-up, for every key you press, and a 3-byte packet (mouse buttons, change in X, change in Y) when the mouse is moved.

When the first byte comes in (literally, a bit at a time, at around 7800 baud), the 6850 taps the 68901 MFP master interrupt controller and says, "I have a byte from the keyboard." It does this physically by pulling down the Interrupt Request line from 5 volts to 0 volts, which means "true." *This is an immediate, no foolin' around request for the 6850's byte to be read by the 68000 CPU.*

The 68901 should *immediately* respond, interrupting the 68000, which fetches the byte from the 6850. (Are you tired of words beginning with "6" yet? Try a PC, where they all start with "8"...) However, you're at IPL=7, non-interruptible . . . so the 68901 cannot interrupt you.

Another byte comes in from the keyboard. The 6850 doesn't have buffers to hold multiple bytes (in the PC world, it is like the 8250; a superior chip, the 16550, has buffer space for 16 bytes going in and out, separately). For byte #2, again the 6850 begs for an interrupt, by dropping Interrupt Request to 0 volts. But the

Interrupt Request line is ALREADY AT 0 volts from the previous, unanswered-interrupt.

Well, at some point, the blasted 68000 "wakes up" from no-interrupt la-la land, and allows interrupts again. The 68901 *immediately* grabs it, shakes it, and says, "Listen, pal, the 6850 needs attention like real fast." The 68000 interrupts what it's doing, grabs one byte from the 6850, and returns to its regular programming. Ooops. The 6850 keyboard comm chip is still holding DOWN the interrupt line, because two (or more) bytes came in while the 68000 wasn't "listening." And here is the kicker, the precise problem:

The 68901 requires an EDGE, a TRANSITION from +5 to 0, to trigger an interrupt. Just holding the line "true" DOES NOTHING. It is "edge triggered."

See the problem? The 6850 is still sitting on interrupt request, at 0 volts. The 6850's Interrupt Request wire never got a chance to bounce back to 5 volts, because no one ever answered it! So the second and later bytes DO NOT GENERATE AN EDGE.

And the 68901 does not register another interrupt. Even though you can go to the 68901, read the interrupt register, "see" the interrupt request, that fry-in-hell chip DOES NOT INTERRUPT without an "edge," which it won't get.

So, all subsequent keydown/keyups and mouse 3-byte inputs get dropped. When the 6850 runs out of room from the last byte, it overwrites it, and that byte is gone.

This is why keyboards and mice lock up. (The mouse is just three bytes sent in the same way as the keyboard, but, the bytes come in *real fast* compared to the keyboard down/up, and, thus, there's *much more* of a chance for the 68000 to drop them and lock up in the same way.)

I did have to shut off interrupts to do the GCR; the GCR requires about 100% of the 68000 to run. No interrupts can be allowed. So, I was burned by this problem. This one took me two weeks to nail down (the nice side effect was discovering many OTHER bugs in my stuff while finding this one). When I read that 68901 MFP manual Yet Again, and, finally, saw the fine-print words "edge-triggered," I threw the book at the wall, and put this code into Spectre.

At the end of a 68901 interrupt coming from the 6850 keyboard comm chip, the 68000 directly reads the 68901's "interrupt request" pins, which go to all sorts of chips. It zeroes in on the 6850 comm keyboard interrupt pin. If the keyboard interrupt is still active, we read the 6850 again, and again, until its interrupt request goes away. We probably have to throw those bytes away (as some are partially "stepped-on"), but we CLEAR that interrupt line back to 5 volts, so it can "edge-trigger," +5 to 0 volts, the 68901 again.

It is best NEVER to shut down this interrupt. It is unfortunate the ST/TT don't give us a clean way to do it, because there are times we need 100% guaranteed CPU.

27. [Hard Software/Hardware Question] *What is a working method of shutting down the keyboard and mouse, then waking them back up, so that the keyboard buffer and mouse don't "overrun" (see #26)? As you can see from #26, this could be necessary for extended work at IPL=7 (no interrupts whatsoever). NOTE: By working, I mean it really works, not what some manual says.*

First, at all times, work directly with the 6850 keyboard chip. (Yes, you'll have to "clean up" the 68901.)

1. Make sure there is nothing "incoming." For instance, make sure you're not in the middle of a mouse-packet. This is not trivial in GEM; you'll have to dig. In Spectre, we have a counter (1-3) of what byte of a mouse packet you are in, and if we're in the middle of a mouse packet, we wait for it to complete. Also, every keypress sends two bytes: one key-down, one key-up. We try to make sure we're not cutting the keyboard off while someone is typing a "normal" key. (CAPS LOCK would be an exception).

2. Send the keyboard-off command (tells the keyboard to suspend sending, "buffer up" things) to the keyboard. The other keyboard shutdown command never worked for us.

3. Wait for two or three times the amount of time it takes to send a byte from keyboard to you. This gives the keyboard time to process the "keyboard off" command and lets any bytes that were "just shipping out" get received. If you begin to receive a mouse packet, you have some problems; turn keyboard back on, go back to step 1, finish receiving it, then try again.

4. Keyboard is now off.

The other, "documented" way never worked for us. See theIkbd manual in the developer docs.

Turning it on is a matter of clearing out the 6850 keyboard comm chip of junk, then sending the keyboard on command. Again, use the "okay, send the stored up buffer" command, not the keyboard on command.

The absolute key thing is to wait the 2-3 byte-times from the keyboard to handle the case of sending a "keyboard off" just as the keyboard is firing, say, a mouse 3-byte packet at you. The keyboard processor is SLOW and it takes time for it to realize it should shut down. This means you must have a precise, and fast, delay loop. This, in turn, means you have to figure out if you're a TT, in which case you need to double up the delay accesses; at least, we found that here.

28. [Really Heavy Hardware/Software Question] *Well, if you're smart enough to get #27, how do you do it so it works on BOTH the ST and the TT?*

The key is the delay loop. You must see if you're on a TT, and if so, double whatever you're doing to delay. Fortunately, the "cookie jar" tells you what machine you're on if it's a TT, so you can check that for your delays.

It is absolutely critical you shut down the keyboard and WAIT for the (slow) keyboard processor to send you stuff before it realizes it's just been told to shut up! Otherwise, you're headed for MFP-edge-trigger-lockup land (see above). This gave us pure bad news during Spectre development.

29. [OldTimer] [Really Easy Software Question . . . well, if you know.] *What did the "bombs" of the crash mechanism look like in the pre-TOS-ROMs version of TOS (that booted up off disk)?*

Mushroom clouds. I'm not kidding. I did like the comment the Atari programmer made in the code: "This is silly."

30. [Hard Floppy Disk Hardware/Software Question] *What precisely is the bug that causes the floppy disk drive read/write capability to drop by half in most ST's (Atari corrected this after TOS 1.4, I believe . . . might have been TOS 1.62. Yet another reason to get a 2.06 card; your floppies will work faster!)*

When Atari wrote the floppy code, whenever they moved the disk head, they did a "seek with verify." (A seek is a "step"; it moves the disk head across the 80 circular tracks). A "seek with verify" means the 1772 Floppy Disk Controller (The FDC) reads a disk sector header and *verifies* from that header it's on the right track, 0-79, since the header has the current track number in it.

The FDC is a simple-minded, slow, slow, slow dedicated computer that works with floppies; it seeks (moves the head), reads, and writes. Be cautious programming it. Assume its slowness. Too many people have been burned like this:

(Tell the FDC to do an operation)

waitloop:

(test if operation is done; if not, goto waitloop)

... completion ...

and had it fail. The reason is simple: the 1772 doesn't get around to setting its "Not Done Yet" (busy) indicator for a long time after you issue a command! You really have to have a delay (see discussion of delays above) after entering EACH COMMAND, to make sure the FDC can get the "Busy" status set for you to test.

Back to the 1/2 speed slowdown.

To see the interaction that causes the trouble, let's follow a sample read, with the disk spinning under us 5 times per sec, 9 sectors per track, 512 bytes per sector. (Sectors are numbered 1-9). Since it's a circular disk, the sectors repeat:

1-2-3-4-5-6-7-8-9 (gap) 1-2-3-4-5-6-7-8-9 (gap) and so on.

First, we READ track 1, sectors 1-9, one right after another. Then we STEP to track 2. The step takes 3 milliseconds, but you have to add 30 milliseconds of "settling time" to let the head stop vibrating. You have to. Anything written to disk with the head vibrating is unreadable later. So around 30 milliseconds of a 200 millisecond track (5 revs/sec, remember) have passed; that's 15% of the disk, including the "end / beginning" of track mark, which is all empty space. You can fit another entire 512 byte sector in there, in fact (10 sectors per track is "Spectre Format"). So, the disk hasn't really *spun* much; its fixed head is "coming up on" sector 1 of track 2, at 300 RPM. (There really is quite a gap between sector 9 and sector 1.)

BUT, because we did a "seek-with-verify," we're still in the FDC's SEEK processing! The FDC reads sector 1 and verifies it is indeed on track 2. Then it returns to READING sectors. We want 1-9. So, it wants sector #1 ... oooops. Sector 1 spun by verifying the STEP! We now wait a FULL SPIN of the disk, 1/5 second, for #1 to come around again, then we read sectors 1-9 off track 2. (The 1772 does not have the brains to read 2-9, then get 1 the next time around.)

See what that seek with verify did to us? It just forced a full spin of the disk on us. To the 68000 CPU, 1/5 second is an ice age. Multiply it out by yourself: on a double-sided floppy, that's 160 tracks x 0.2 seconds extra per track, or 32 seconds. Fun. (And if you're using double-sided disks, switching sides ALSO forces a spin on you while THAT is verified. True horrors.)

31. [Hard Floppy Disk Hardware/Software Question] *How can this be fixed without, say, burning new TOS ROMS that drop the "seek with verify"?*

It can be fixed with a *new disk layout*. Let's fix this mess without just patching out the Step-With-Verify instruction to a

simple Step. Let's go to the disk, and format it in the following way, from the beginning of the track to the end, sector ordering:

Track 1: 1,2,3,4,5,6,7,8,9 (gap, then repeat)

Track 2: 8,9,1,2,3,4,5,6,7 (gap, then repeat)

Track 3: 6,7,8,9,1,2,3,4,5 (gap, then repeat)

Track 4: 4,5,6,7,8,9,1,2,3 (gap, then repeat)

Track 5: 1,2,3,4,5,6,7,8,9 (gap, then repeat)

(and we repeat the pattern).

NOW look what happens (follow along). We READ 1-9 on track #1. We STEP to track #2. We VERIFY the STEP with sectors 8 or 9 on track #2; I give two sectors for reliability, because disks miss sector headers sometimes (everyone who is sane/experienced with disks builds in retries because of this). Now, the FDC has verified track 2, it's done with STEP, and it does a READ of 1-9. Well! Sectors 1-7, then 8-9, are just coming up! Zzzip, it reads them, and you have just roughly doubled floppy speed.

Dan Moore and I came up with this during a beer/programming session, one of many for *START* magazine that resulted in programs and articles, and I wrote an article calling this the "Twister" format. It works, too; we used it to make a backup program called "Meg-a-Minute," which literally transferred a megabyte per minute from hard disk to floppy. You can't do any better than that, physically, with floppies. (Ok, ok, look, at that time, 1.44 meg HD floppies were not available, ok? This was pre-1990's! We could do better with 18 sectors per track and 360 RPM ... and yet ... and yet ... the principles remain the same.)

Oddly enough, we later saw disks formatted by the new TOS from Atari had been "twisted," and the "format" command in the XBIOS had a "number of sectors to twist" parameter added. It's nice to see Atari and us thinking alike. (grin)

32. [HARD Floppy DISK Hardware Question] *Why should you definitely wait 30 milliseconds after a STEP (from one track to another, or multiple STEPs) before beginning to write to disk? What are the consequences if you don't?*

When the disk head is moved, it reaches its destination, and "rattles," literally vibrating back and forth. This is because of how violently it has to be shoved to move at 3 milli-seconds per step (3/1000 sec per track!). When it reaches the new track, it vibrates at its natural resonant frequency, swaying back and forth on the track, up to 1/2 track off on both sides, in a sine wave.

If you DO NOT choose to use the built-in 30 millisecond "wait for it to quit rattling" option in the FDC, and start writing immediately, your disk write will follow that sine wave, swaying back and forth across the disk track, and your chances of reading it later, frankly, are doomed.

Sigh: I once ran across a user-group article telling people to write the TOS ROMS into EPROM, and "fix" the "step slowdown" by changing the "step with verify" to "step." Alas, in making the new SEEK command, they left out the 30 millisecond delay, too, which was bad news.

Truly weird: You can READ well enough while sashying across the track to verify a STEP, but still be writing a sine wave across the track.

Also: there's a thing called hysteresis in disk drives (and other things). Imagine you're on track 0. Seek to track 50. You

land, stop rattling. Write something. Now go to track 70. Seek back to track 50, stop rattling. Write something.

They will almost certainly be at a different radius—literally, offtrack. This is hysteresis—doesn't land on the same place depending on where you came from. Generally, the newer and higher quality the drive, the closer they will be.

What to do? One way is to patch the floppy driver (not easy; XBIOS is not easy to patch!) to ALWAYS approach a track from one direction, even if you need an added SEEK to hop over it. This is not dumb; remember, as floppy drives get older, generally tolerances open up, and hysteresis gets worse. This is a program worth writing.

Another is to solve the actual problem, which is the "floppy error" message. First, re-establish your track 00, taking care to step out five times first, lest your disk head be stuck behind the sensor (if you're on track -1, the TRK00 wire will be "false"). Now, add retry code which seeks to the track from both directions, trying to do the read/write that failed. Do AT LEAST 10 retries before you punt, switching directions back and forth.

Frankly, we did this with Spectre GCR, with the addition of essentially recalibrating to the disk's written data speed. This is why GCR takes so long before giving up and putting up the "Can't read, want me to format it?" dialog box—it is busy pulling out the stops to read. The retry code is so successful we use it to read marginal disks all the time. This is why GCR can read disks that Macintoshes cannot. When Sandy has a Mac disk she can't read, she brings it to a GCR, reads it, and copies it to a new disk. (This is routine for us)

(And has anyone ELSE noticed that high-density drives [1.44 Meg] have far more trouble with low-density disks [720/800K], particularly in MacLand? I keep one low density and one high density floppy around just for this.)

33. [OldTimers]: *CP/M-68K had a debugger. It could not disassemble one very popular opcode (especially in interrupt code!!). I saw this on a machine called Dimension 68000, which ran CP/M-68K. It was passed on to AtariFolk in a debugger (called DDT68K/SID), and still had the bug. It was finally fixed. What was the opcode?*

MOVEM (as in MOVEM.L A0-A7, (A7))

I told Leonard Tramiel about it, and next release, it was fixed. Give him credit.

34. [Humans/Electrical Engineering-Hobbyists] *What is the A.C. voltage on the tall heat-sink of the power supply found inside the Mega ST's? Measure against, say, board Ground. Be sure meter scale is on multiple hundreds of volts and A.C.! (CAUTION WHILE MEASURING!!!, Really!!!)*

Three Hundred Volts, varies a bit.

Now, for fun, hook some tinfoil as an antenna to an oscilloscope. Get it in the general vicinity of the heat sinks. It'll pick up a fine, strong sine wave. You'll find it's oscillating at around 2 Mhz. This is Not a Good Thing to have RIGHT NEXT TO THE Floppy! Goodness, the floppy's read head is just a *pickup coil*—the *perfect thing* to pick up a 2 Mhz signal being thrown by this antenna. (This played merry hell with Spectre GCR, since the MacSignal was 2 Mhz on inner tracks of the disk. We, finally, found a way to shield against it, using tinfoil. This immediately improved ST mode reliability, by the way, as well.)

I don't want to tell you how many times I've reached for RESET (or something), brushed my hand on one of these heat sinks, and been thrown across the room. Once I managed to get one hand on a ground and brush the heat sink, and everything in the electricity's path hurt for days . . .

35. [Humans/Don't Try This!] *How far will you be thrown if you brush your hand against that heat sink? (Please convert kilometers to miles.)*

My record is as tall as I am (because I fell like an axed tree): a half inch under six feet. Miscellaneous writhing and sound effects don't count.

36. [Humans/Don't Try This!] *How many days will your arm and chest muscles ache after brushing your hand against this heat sink? (Please convert months to days).*

About a week. I felt like I pulled every muscle going across. Probably only skin effect prevented some serious heartbeat "hacking" by that heat sink.

37. [Humans/Don't Try This!] *How many days will it take before your hair stops looking like Young Einstein's hair if you do this?*

Mine never has, really, but it looked that way BEFORE I got zapped the first time. Nowadays, when short hair is fashionable, I just keep it really short, but in the long-hair days, it was . . . well, I keep an old driver's license photo to show people. They're amazed.

38. [Overseas Travellers, Easy] *Summarize quickly the major difference between US and UK, French, German, and Swedish keyboards.*

There are two kinds of ST keyboards: US and International. US Keyboards, as far as I know, are only used here in the USA. International keyboards have various character sets printed on them, depending on the country they are being built for. I have seen many, many "possible" keyboards. We spent much time with GCR foreign dealers/testers getting the keyboards just right, so the key they pressed showed up onscreen.

(Apple, in the meantime, was distributing "localized" System files which worked with a particular country's keyboards. Trouble came when someone would run a System "localized" to the USA on an International keyboard. They'd find, for instance, all the keys on the lower row shifted one to the side. We finally put out a tech bulletin to help people, and provided a "program it yourself" keyboard file that was loaded at runtime, so people could customize. That seemed to do it.)

International keyboards have a smaller left SHIFT key and one added key on that row. They also have one added key on the third row up, right below the numerics. US keyboards have a key to the right of RETURN. (It is very valuable for a USA developer to get an international keyboard, to see the layout and provide translation tables.)

Also, on four keys near the RETURN key, there are FOUR characters printed; the one you get depends on SHIFT and ALT being pressed (I've seen this on French & German keyboards). I still, honestly, am not language literate enough to understand the various key presses that go into accents and so forth.

I was hoping someone would tell me what the Swedish layout is. (*grin*) Actually, we do have a printout of all known Atari and Apple keyboards here, so we can do translations.

39. [Hard Hardware/Software Question] *What is the exact bug, and when was it fixed, in serial (modem) handshaking?*

The RTS and CTS pins (4 and 5 on the DB-25 connector; different on 9-pin) control handshaking: an external device, say, a printer, can ask the ST to shut up for a moment while it prints, using the RTS and CTS pins. While an effort was definitely made to read the hardware handshake pins and not just ignore them from the very first try of the low-level interrupt-circular buffering serial code BIOS (see developer doc listings), the code was just plain broke. (I personally think that having the serial code handle BOTH hardware and "soft handshaking" was the real problem; soft handshaking was done through special bytes, XON/XOFF (ctrl-q/ctrl-s); they tried to do too much with common code. Remember, they WERE trying to cram everything into 192K of ROM.

A case, for example, could develop where XON/OFF and hardware handshake sent different signals; e.g., hardware said "go," software said, "stop." Which do you give priority?

There were several fixes to this, unfortunately, that didn't fix things, but people often don't "test to worst case," because it takes too long, and every operating system person at Atari was working with a LONG list of priority things to change and add and fix. I know; I was there. This fix was down on the list a ways compared to, say, taking one minute to launch a program because the memory-clear routine was slow, or the 40-folder bug, or making AHD1 not fail when a disk partition was full (the partitions, at one point, accidentally overlapped: disaster for #2).

A final patch is out; I've seen various names for it. SERPTCH2 is one of them. It's run in the AUTO folder at startup time and patches the serial interrupt vectors (via the MFP68901) to itself, and handles things pretty well.

Now, of course, we have to see if the 800 modem programs written that bypass SERPTCH2 to "fix it themselves" get it right. This is a surprisingly subtle problem.

40. [Historical: Easy Software Question] *Which TOS fixed the interminable delay on saving a file if your disk was getting full?*

TOS 1.4. Atari rewrote GEMDOS (the Disk Operating System portion of GEM) so that it didn't take a year to scan for the Next Empty Sector, which was the problem. (The only way to speed things up before this was to deliberately move files to the outer areas of the disk and leave the inner areas open. I can recall doing an article on just this, advising people to leave the inner parts of a hard disk open for repeated compiles/assemblies. I did it for the Mac emulator; it made 10 minutes' difference. You'll find disk optimizers from this era that do that; now you know why. The inner area was MUCH faster than the outer, before TOS 1.4.)

41. [Historical: Easy Software Question] *Who rewrote the Disk Operating System section of TOS to do this?*

Allan Pratt. He's at Taligent now.

42. [Historical: Easy Software Question] *Okay, who wrote it in the slow way to begin with? HINT: Usenet users have an advantage on these questions, as The History of TOS was given out there.*

I am not totally positive on the name here, because I lost the Usenet "History of TOS" (which had the correct name) to a hard disk crash between the competition and the answer. (Kind of the story of my life). However, from what I recall, a guy named

Jason "Born To Code" Loveman (last name is very possibly wrong, but "Born To Code" is not) at Digital Research wrote an MS-DOS "clone" (in terms of operating system calls) in "C" as a hobby-type project, and when DRI suddenly needed an MS-DOS compatible DOS for Atari that could move to 68000 with a re-compile, he had one "on the shelf." Alas, it just was not optimized, which led to the "when the disk gets fuller, it slows down more" problem.

Do remember that in 1984-1985, Atari was *desperately* trying to get the ST out the door and survive, and it was an open bet whether they would be around in even a year; shipping ST's mattered, optimizing did not.

I personally feel, perhaps, quality control might have suffered. On my first 520 ST, the first time I clicked the mouse, a capacitor in the power supply exploded! (No relation between events).

43. [Very, Very, Hard Software Question] *How many birthdays are celebrated in Spectre GCR 3.0 upon startup?*

Barb Hahn, Dan Moore, Doug Wheeler, Sandy Small, Dave Small, Eric Small, Jenny Small, Jamie Small, United States, New Year.

If you click on the "Happy Birthday!" box, you'll get a picture pop-up of the person! (On some of them). Depending on your monitor, the aspect ratio may be wrong; color will be okay, mono will be "squashed."

44. [Very, Very, Hard Software Question] *How many different quotes are randomly selected from in Spectre GCR 3.0 (if it's not a birthday) upon startup?*

There are well over 100. Trouble is, the random number generator isn't as random as we liked, so it doesn't select that "it's time to print a quote" NEAR as often as wanted. This is now changed to greatly increase the number of quotes in Spectre 3.1.

45. [Medium Software Question] *What was one major anti-piracy protection placed on the Spectre 128, version 1.51, release disk?*

Whooo, is this going to irritate some people! Well, we put a *second* .TOS/.PRG program file, apart from SPECTRE.PRG, on the release disk. It was a GEM-format, executable file, WITH labels on it, so anyone could disassemble it, AND DID tear it apart. (Not stripping labels is unusual, since it makes it *real easy* to understand and tear apart the code when the labels are names that make sense).

Many people assumed that *this* second file was the running Spectre; that SPECTRE.PRG did the menus and stuff, and jumped to the second file for startup when you selected "Start Up." I hate to tell you this, but the second file was not. It was a COPY of a VERY early developmental Spectre, *which did not work* (it died with an interrupt stacking problem, which is very hard to fix), and for good measure, we yanked out several really crucial parts. We did make sure there was text in there saying "128K ROMs" and "Spectre," though.

Thus, when file crackers went through this code and stripped out the Really Obvious Copy Protection stuff, (yes, it was LABELLED "copypro," for copy protection, okay? That's Really Obvious!) it didn't make any difference—*there was no way that code was going to run*. It took me a couple months after that version to have something that would even startup to the

Mac desktop. The real code, the Spectre run-time stuff that makes the Mac programs work, *was somewhere else*. It took a very long time for pirates to find and crack it, which gave us time to develop Spectre GCR. This was very important since we needed the Spectre 128 revenue to develop GCR, make house payments, eat, that sort of thing. This protection gave us time. The GCR cartridge itself is a fine "hardware key" in terms of copy protection. (If we don't see the 128 or GCR out there working, we let the user know. Lots of code crackers have been earnestly told that there is something *terribly wrong* with their GCR as they crack their way into the code.)

46. [Medium Software Question] *Why was this protection so hilarious?*

Because so many pirates spent so much time cracking and disassembling a red herring—a file, with labels, that looked Very Much like the real thing. Because they spent time there, instead of somewhere else, Spectre 128 didn't get pirated until Spectre GCR was nearly done. That saved Gadgets until GCR was out, and there's just no way to read old GCR Mac disks with a no-GCR, pirated version. (Thus, "its own best key").

47. [Trivia Question] *Why didn't the "Alarm Clock" work for SO LONG in Spectre?*

How embarrassing. In my disassembly of the Mac ROMs, I had turned to the Vertical Blank (60 times/sec) code so many times that the top of the printout crimped. One line of code was invisible! That was the line that a one second Mac timer kicked; it incremented a 1-second counter the Alarm Clock used.

This was only found by accident. I was working Yet Another Problem, disassembling the code I saw in the ROMs vs. what was on the printout . . . and here is this increment! . . . finally I unwrinkled the top of the printout (the "missing" line was actually on the serrated portion of the paper) and saw the ADD.L #1. to the clock.

I added something to the tune of 60/70 ticks (depending on the monitor; color is 60, mono 70) incremented this, and Alarm Clock came up. So much for "neat printout folders."

48. [Trivia Question] *Name all the releases of Spectre. How many are there that made it out into the world? Include Spectre 128 and Spectre GCR.*

Over two hundred versions of Spectre have existed in Beta-Test form. For instance, we went to 19 Beta Tests on Spectre 3.0. When I say Spectre 1.51, I mean we began with Spectre 1.00, and incremented versions as we fixed things, and it worked at version 51.

Only the most debugged, best-we-could-do versions ever went to customers. Here's the "Official" release list:

Spectre 1.51:	Original release, Spectre 128. (Yes, there WERE 51 versions of 1.00 that the Beta Testers helped me find.)
Spectre 1.75	
Spectre 1.9F	(sound!)
Spectre 2.3K	Original GCR release
Spectre 2.65	Better GCR release
Spectre 3.0	Current release, many things added

New on the Menu (in Alpha Test again, code added):

Spectre 3.1

- * TT-SCSI support added; ACSI & SCSI both supported.
- * HDX and XGM partition support added (gah!). This took FAR longer than I wanted but was necessary with the number of users using HDX, etc, to format their hard disks.
- * Various minor bugs fixed.
- * Work being done on adding TT-RAM to usable memory, but that may not make release; I can't get the algorithms to work in ST mode to test! And I don't know why . . . something I don't know about the MMU.
- * Work also being done on bringing up System 7.1. (7.0.x is not worth it). The numerous patchouts of ROM code make this difficult.
- * I would prefer to ship it with TT-SCSI and HSX/XGM support solid, then work on TT-RAM and System 7.1 without time pressure.

49. [Trivia Question] *What was the sound in the hidden dedication page of Spectre 1.51?*

(yes, this is true!) It all started with a guitar. A guitar with sheer volume feedback sustaining a chord (I held my Ibanez near my Fender SuperTwin (385 watts!!) until it just screamed/rang, then fed THAT to a wah-wah pedal that was a project in some electronic filters book. A wah-wah pedal is just a "notch" filter—it filters out a "notch" of the audio spectrum. This particular pedal was light-driven; a photo-sensitive resistor controlled the frequency that was notched out (no light=low, bright light=high, between about 100 and 10,000 hz.)

THEN, we used a sine-wave generator (part of an ARP-2600, and I'm really dating myself, huh? That's pre-MIDI) into my dad's old (tube) stereo. The speaker output went into *flashlight bulbs*. If you turned the volume up *very carefully*, the flashlight bulbs would slowly grow brighter and dimmer with the sine wave, following the ARP's signal generator. (I blew out LOTS of lights. The volume control was really tough.)

And, then, we took the repeating guitar-chord, fed the signal from the guitar into the wah-wah pedal and thence to a reel to reel Sony tape recorder. (Dating myself again). But we fiddled the wah-pedal, which makes the noise so unique.

And as the touch that made it all worthwhile, we started the ARP sinewave frequency very slow (1 wah/sec) and as time went by, we turned the knob up to around 5,000 wahs/sec, at which point the guitar and wah-pedal and lightbulb were making a noise that sounds like, well, "... breaking through the edge of the envelope." It sounded to me, oh, like the moment I re-read the 68901 MFP book and found out Spectre was possible; the moment I first saw "Welcome to Macintosh" on an Atari screen; the first time *MacPaint* ran; and seeing "my baby" in InfoWorld magazine. And it sounds one heck of a lot like winding the Camaro up in second gear through a hundred MPH on an entrance ramp.

The sound for Spectre was just digitizing the Sony tape, which I still had from college, with *ST-Replay*; I did the audio work in college as a extra-credit music project, and got a much-needed "A" from it. As I recall, the full tape had all sorts of other effects on it, and the section that went into Spectre "was inspired by" Gandalf & Company in the Mines of Moria, meeting the Balrog monster. (See The Lord of the Rings, J.R.R. Tolkien.)

50. [Harder Trivia Question] What was the updated sound made available to Spectre users, with the advice it was wind-chimes and hard to hear, so they'd better turn it up?

Practical joke time. I uploaded a new SPECTRE.SYS file for users, and advised them in comments it had a very low volume, lots of wind-chimes, so it sounded real new-agey. All SPECTRE.SYS was (it now has runtime code in it--be careful!) is a 11 Khz digital sound file.

What it WAS was "... Let's rock!" and the sound of machine gun fire from "Aliens." ("Rock'n'roll" is THE term for full-automatic fire, preferred around the world.) And it was WAY loud.

Sandy Wilson's reply: "I just scared my cat, who was sleeping on my monitor, three feet straight up!" (or something very close to that).

I have a poster of Sigourney Weaver in Aliens in my office.

51. [Awww, Heck, Give 'em a point] Who's buried in Grant's Tomb?

Grant, of course.

From this came the term "land-grant." From THAT came the term "land-grant college," or "agricultural college," or "Aggie," or "state college" (like, Colorado State University, or x State University). The Feds would "grant" the state a huge amount of land;

the state would sell part of the land to raise money, and put the college on the rest of the land. I know that in CSU's case, this resulted in a big, beautiful open college, because it wasn't all crammed together. (Like, for example, our Other state college).

I met Sandy while getting my CompSci degree at Colorado State. She got the same degree with a far higher GPA than I did.

* * *

There you are, an expert-level quiz on the Atari, and answers. I hope the answers help those of you who are working on some of the chip-level stuff in the Atari, pushing the envelope. I hope this brings back a few memories, too!

See you next time, and I hope you had some fun!

Dave Small / VP

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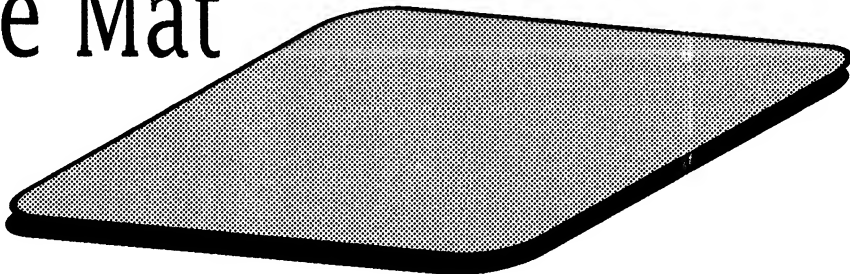
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These signons have not changed in 5 years (at least).

P.S. I wonder if I can get an account on the Toad Computer's WWW and Internet machine? (grin)

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Hotel room rates are discounted for AtariFest guests, but you must telephone the Indianapolis motel--not Best Western's national toll-free 800-number. Call 317/299-8400 ext. 393 and ask for the "Catering Staff," then tell the Catering Staff that you are part of the AtariFest. If you call at night or over a weekend, the Catering Staff may need to call you back. Book rooms soon; the hotel filled up early last year.

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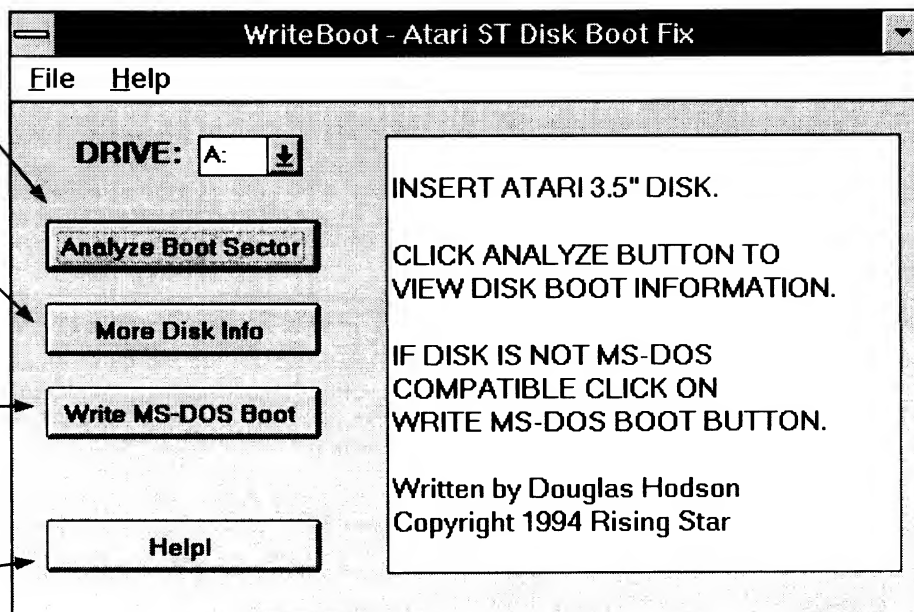
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